SUPPLEMENT.

The Mining Journal,

AILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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Original Correspondence.

CUMBRIAN METALLURGY—No. III.

WEST CUMBERLAND IRONWORKS.

r in the hills and valleys of the English lake district iron is found it is astonishing to see how soon a line of rails wn, and blast-furnaces spring up. A peculiarity of this e, however, strikes the observer—there is no antiquated rk the progressive development of the trade: no low fur- pyramidal steel ovens; no tackler's skip dangling in the st its load of miners, with outstretched arms, carefully their frail cage from projecting rocks or bulging brick- skeleton engines asthmatically struggle in the open air, nd visible signs of the financial pressure in the office. The the last few years, the iron manufacture of this district d on the level of former experiences, and bids fair to se- itself a well-earned reputation. At present there are in nd 29 furnaces in blast, with a total annual out-put of ns of pig-iron. And when we consider that these furnaces about one-half the iron ore produced in the locality, it once seen that there is every prospect of extended iron n in the future.

natite ores of Cumberland, especially when mixed with a ntity of the pure areanaceous Irish ores, are admirably rom their high percentage and their purity, for the pro- f steel by the Bessemer process. This is further subserved nparative freedom of the Cumbrian coal from sulphur and us, a condition of primary importance to the manufacture

est Cumberland Ironworks, situated at Workington, is one ost important in the county. Through the courtesy of the Mr. Warton, every facility was afforded us for inspection. -furnaces, five in number, are 55 ft. high, which is some- than the height of the most approved North of England but it is proved by experience to suit the class of ore used. mous Barrow Works the furnaces are 56 ft., in preference ft of the North Lancashire Works. The fuel is Durham some admixture of coke made from the coals of the loca- h are, however, not firm enough if employed alone to re- ressure in the furnace. The waste gases are utilised to team-boilers, according to the method commonly practised Staffordshire. The furnace materials are drawn up an in- separate engine, with a wire-rope, in the ordinary fashion, ine being fitted with double rails for alternate cages. A nce, on Whitwell's plan, is in course of erection. The hot- used, the heat being applied by means of the ordinary arrangement.

es used are—1. The local hematites, averaging 56 per cent. It is to be observed, however, that the richness of these creasing, owing to the less care exercised by the miners n formerly in their extraction. Being mostly worked by te system, the men are naturally more anxious for quantity lity, and often make up the tonnage at the expense of the ge.—2. The Irish ores, from Antrim and Down, contain nt. of iron, with about 20 per cent. silica, and 10 per cent. This ore, as will be seen from the foregoing constituents, xial action in the furnace, and the amount charged varies t with the nature of the ore and the character of the iron . As flux the limestone from the neighbouring quarries of is chiefly used. The furnace charge (the proportions of e shall more fully discuss in treating of the Barrow Steel Works, as the weights are pretty constant throughout the of the Cumberland ores) was not so intimately mixed as we s the practice in the Belgian furnaces. The materials are together with an intention to mix them, but there is no ic care to see that they are uniformly incorporated in equal ons throughout. The proportion of coke consumed amounts 15 cwt. per ton of ore, a rate which seems susceptible of . In the neighbouring furnaces, belonging to the Moss pany, the proportion has been brought down to 1 ton of coke to 1 ton of ore. It is but fair to add that rich ores used at these furnaces, averaging in the mass 53 per cent. and we observed that the ores were charged into the fur- ithout previous calcination, and every care was employed e the complete mixture of the materials in the barrows.

urn to the West Cumberland Works: 70 coke ovens, built about 20, are in operation. Here the coal and slack are into the oven by the front, which is open for that purpose. t is then built up with large bricks, perforated with holes, in., for air. As the combustion proceeds it is gradually by stopping up the holes with clay, beginning at the bot- e were surprised to find the products of distillation were ed; all except the coke was allowed to escape—tar, gas, , with their thousand and one secondary productions. In- this respect, English manufacturers would regard with as- nt the extensive utilisation of these products by the French, bly so in the Paris gasworks, at La Villette. Possibly the mberland Company will be induced to modify their present coke burning, for we find they have secured the services of igent and competent chemist, Mr. G. F. Downax, and their s hitherto been marked by energy and spirit.

al coals contain about 1 per cent. of sulphur, which is only dissipated in the coke ovens, and the crude iron is found n ·07 per cent., which compares favourably with other brands. sphorus is still smaller in quantity, amounting in the pigs ·03 per cent. One of the chief ironworks of Germany, the xon, sends out pigs containing ·15 per cent. of phosphous. est Cumberland furnaces produce about 50 tons each per king a weekly output of 1750 tons. Part of this is sold in another portion is manufactured into bars, sheets, rods, &c. e 40 puddling-furnaces, of the ordinary reverberatory type, by hand. The puddled blooms are shingled and passed on rge train, or to the two-plate mills. Siemens' gas patent pted to a few of the furnaces, but on the day of our visit re not in active operation. The chief portion of the crude anufactured into steel for rails, &c., by the Bessemer pro- e pigs are first melted in two cupolas, which are blown by means of jets of steam. About two hours suffice for the smelting of a charge, and the liquid metal is run out into the converters, which are kept on blowing "half speed" during the interval of each operation, to keep them hot. The converter then being erected into position is put into full blast for about 20 minutes, by which time the pig-iron is supposed to be totally decarbonised. The process is then suspended for a few minutes, to add a small quantity of spiegeleisen, an alloy of iron with about 10 per cent. of manganese. This alloy confers on the mass, among other properties, a small proportion of carbon. The blast is renewed a minute or so, to complete the mixing, and the steel is next tapped out into ingots, in the usual manner. These masses of steel, from 12 to 16 cwts., are next treated under an immense hammer, to harden and consolidate the metal. The crude pigs here used for the Bessemer steel contain—Iron, 94·00; carbon, 3·25; silica, 2·75; sulphur, ·07; phosphorus, ·03 = 100·1. At the close of the Bessemer operation the steel contains ·05 per cent. of carbon. The blast for the converters is supplied by a horizontal engine with two 4-ft. cylinders. The piston-rods come through the bottoms of cylinders, and there is said to be no special wearing of the collars apparent. From 800 to 900 hands are employed. They work 10 hours, the masters of the district having successfully resisted an attempt some 12 months ago to reduce the working time to 8 hours.

MANUFACTURE OF IRON WITH HOT COKE AND GAS.

In the present modes of using fuel used in the smelting of iron ore the waste of heat is enormous, and from the large quantity of iron made it is a matter of very great and increasing public import to find a remedy. At present the volatile combustible gases are by the heat in the lower part of the furnace driven off unburnt, or nearly so, and the nuisance of smoke is caused. Where the coal is coked these gases, which in reality constitute the most valuable part of the fuel, and a considerable portion of the fixed carbon of the coal, are altogether wasted in the coke oven or open kiln, generally at once the coal being so treated immediately on being drawn out of the pit. This waste, taking the calorific value of the gas into account, is on the average fully one-half of the heating value of the coal, and a large proportion of the iron of the country is made by coke fuel. When the coke is being drawn it is cooled with water, and thus the heat, which if made available would materially aid in the smelting of iron, is lost, and the water used in cooling is to some extent absorbed by the coke, and requires to be evaporated by heat in the iron furnace, requiring combustion of fuel to do so; and the re-heating of the coke before it can enter into combustion also requires the consumption of fuel.

By the present modes the liquid hydrocarbons obtainable from the coal are also lost. Thus the fuel cannot be used so as to obtain the advantage that will arise from the immense reducing or smelting power of the concentrated heat of the gaseous or volatile and liquid combustible portion of the coal, and the improvement in the quality of the iron from the ore being reduced or smelted at a higher temperature from the consequent more thorough separation of the earthy part of the ore or slag, and also the improvement of yield in the ore, as from the higher temperature the slag will not only be more thoroughly separated from the iron, but the iron will be more thoroughly separated from the slag. In puddling-furnaces the gas from the coal used contains a considerable portion of the sulphur generally contained in the coal, which passes off with the combustible gas to the iron being puddled, and a considerable portion of the solid part of the coal is necessarily used in the fires of the puddling-furnaces simply to sustain the fire. The combustible gases of the coal partly pass off imperfectly burnt, causing not only the nuisance of smoke but waste of carbon, and there is the expenditure of much heavy hot labour in firing.

Such being the views entertained concerning the existing processes of iron metallurgy by Mr. W. MICKLE, of Tynemouth, he proposes to treat the coal by dry distillation in retorts similar to those at gasworks in use in towns, and to have the gasworks contiguous to the smelting furnace; the works having the usual plant of retorts, gas holders, &c. And he recommends that the gas should also be purified thoroughly, as in ordinary gasworks. To economise the heat, and to have the immense advantage of smelting the ore on a body of fuel thrown into the furnace hot or red-hot, or approximating to red-heat, he draws the coke from the retort at the red or white heat, or whatever it may be, into iron or other suitable tubs or carriages without having the coke made cold with water or without cooling it with water, and convey it to the smelting-furnace and discharge it into the furnace as fuel, as the fuel is ordinarily charged, or if requisite from the heat, by engine power. With this he combines the use of the coal gas, and also the naptha or other combustible oil or spirit obtained from the coal used for smelting, the gas being simply pumped from the gasholder by engine power through pipes and tuyeres to and into the furnace (in a similar way to the air pumped from the blowing-engine). If the said liquid hydrocarbons be used in the smelting-furnace they could be similarly pumped from a tank or receiver. He recommends that the gas be well purified, and also that valves opening to the furnace be fixed or joined into the pipes near the furnace, so as to prevent any return air getting mixed with gas in the pipes, and causing an explosive mixture. The gas not used in the smelting-furnace can be appropriated to the usual lighting and heating purposes, and the liquid hydrocarbons can be used for general purposes.

In puddling iron he distils the coal in the same manner, and pumps the coal gas as fuel from the gasholder through pipes, and also the air required for combustion through pipes from ordinary blowing apparatus similarly to that for smelting into the puddling-furnace to puddle the metal. He recommends the gas to be thoroughly purified, and the air and gas pipes, &c., to be conveniently small and numerous, and well mixed together, so that the air and gas may be well mingled for the purpose of obtaining thorough combustion. Or the air may be supplied as at present, but he recommends it to be pumped through pipes. The gas coke can be used for smelting or any other useful purpose. This mode will prevent or greatly diminish the labour of stoking or firing, and the impurity from the coal and the smoke, and also the waste before named. The heating of the air-blast will not, he thinks, with the use of the coke put into the smelting-furnace hot or red-hot, and the coal gas pumped in as above, be found needful, as the heat will independently of the air being heated be so great that the heating of the air may be dispensed with. The air might be heated at option, and where esteemed convenient by the air-blast pipes being passed along or round the retort furnaces or flues or chimneys, in such a manner as to get the benefit of the waste heat from them. The coal gas will for pumping require to be cleared of the tar, and should be well purified; but after allowing for what condensation these require, it will save heat by pumping it into the furnace as nearly to the temperature the gas leaves the retort as may be, and the gasholder and the pipes from the retort could, if thought desirable, be covered with felt or other covering.

The retorts may at option be heated with the smelting furnace waste gases, or the carbonic oxide, hydrogen, &c., and heat of such waste gases. The retorts may also be so heated with the puddling-furnace waste gases. The gas engine boiler fires if the air-blast engines be not used for pumping the gas as to smelting, or if pumps be not attached to other engines at the puddling-works can also be so heated. The coal gas is pumped into the smelting-furnace in close proximity to the air, so as to be most powerful gas blow-pipes, and to obtain a most intense concentrated heat in the hearth or crucible. And he believes that from the use of coke put into the smelting furnace hot, and the use of the gas as before named, the increment of heat in the furnace will be very great, and that consequently on this the flow of metal will be rapid, and the produce from the furnace much increased. The calcining of ore will not, he thinks, with the charging of hot coke into the smelting-furnace, be found requisite.

After allowing for the fuel required for the deoxidation of the ore, and the carbon of the fuel necessary for the carburisation of the metal, he believes that with the intense concentrated heat from the gas blow-pipes, and the use of coke put in hot, much weight of fuel may not be needed, and that, therefore, the enormous weight of air at present used for combustion will be greatly diminished, and a great saving of the engine power and b owing apparatus for pumping the air, and the fuel and labour used for such engines will be effected. Although it may be found advantageous to have large furnaces, yet from the use of a mass of coke thrown into the furnace hot the produce of metal from the furnace will be so large that in future the iron smelting-furnaces need not be, he thinks, erected so large and costly as at present; smaller and cheaper ones yielding metal in large quantities.

The intensity and increment of heat by this process will more highly liquify the metal and slag in the iron smelting-furnace, thus more thoroughly separate the metal and slag, and as a result the iron will be purer and better in quality, and more yield from the ore than at present. He believes that with this process a great deal of small and inferior gas and coking coal, hitherto found unsuitable for iron smelting, will be rendered available for smelting. Supposing that there be used in the iron smelting-furnace to make a ton of metal 25 cwts. of coke, and 5 cwts. of this coke be absorbed or required in deoxidising the ore and carburising the metal, there will be 20 cwts. of coke for combustion with the air pumped in, and about 8 tons, or about 240,000 cubic feet of air pumped into the furnace for combustion with the coke, about three-fourth parts, or 6 tons of such air will be nitrogen, which is not only non-combustible but requires heat, and consequently the consumption of fuel in the heating stoves, if hot air be used, and in the blast-furnace to heat it to the temperature in the furnace or the hearth of the furnace; thus about 6 tons or about one-half of the whole of the materials put into the furnace being not only useless (excepting perhaps as to cyanogen) but detracting from the heat of the furnace and requiring fuel to raise its temperature. The use of coke put into the furnace hot, which heat assists in the smelting of the metal, diminishes the air, and consequently the nitrogen required, and lessens the detraction from the heat in the hearth caused by the nitrogen.

Mr. Mickle is of opinion that on smelters becoming familiar or thoroughly conversant with his process, the use of coke put in hot, and coal gas, will from the intense heat give so much and so potent a command over the reduction or smelting of the ore, that 8 to 10 cwts. of the gas produced and heated coke may be found sufficient in the furnace for fuel, inclusive of what is required for deoxidation of ore and carburisation of metal; if so, it will only require about one-fourth of the air, or about 2 tons, thus diminishing the available air-blast power required three-fourths; and, as before named, he believes that previous calcining and heating stoves may not continue to be used, and the engine boilers and retorts may be heated with the furnace waste gases; the general result would be that the metal may be smelted with the total consumption of about ½ ton of coal. And supposing that on the average there be now used to make a ton of metal for calcining, engine power for pumping the air, heating the air, and smelting the ore about 3½ tons of coal, the net saving would be about 3 tons of coal in making 1 ton of metal, and as there are now making in this country nearly or about 7,000,000 tons of pig-iron annually, the saving at the present rate of make would be nearly 20,000,000 tons of coal annually, which is a matter of very great and increasing importance. He does not bind himself to the extent of saving mentioned, but thoroughly believes it will be so, that is, the reduction of consumption of fuel to about 10 cwts., or the general saving of 20,000,000 tons of coal on the present make of pig-iron annually, more or less, or approximating to it.

It is claimed that the process will enable iron to be produced much cheaper, and thus stimulate the building of iron ships, railways, &c., and generally foster the staple industries of the country, as well as free a large quantity of coal for domestic use, which is much needed, and which would be a great boon to the poor and to the public generally. When convenient it will be desirable for the puddling-furnaces to be near the smelting-furnaces, so that the heated coke made in distilling coal for the gas for puddling may be used in the smelting-furnace, and thus save the heat of the heated coke; and also that the air-blowing apparatus attached to the smelting-furnace may be available for pumping air to supply the combustion at the puddling-furnaces. When the coal gas is well purified he believes it to be a very pure or fine and superior description of fuel, and will aid in making higher class iron, whilst coal gas purified as ordinarily and used as before named for puddling, will tend to make better malleable iron, and that both as regards smelting and puddling there will be much more command over the heat of the furnace, as the force of gas and air and consequent instantaneous heat can be increased when desirable by accelerating the motion of the engine and pumping. Where there are beds of iron ore at a distance from coal,

as for instance those in the oolites and lias, he considers that this process as to the fuel will be of great value in developing them, and may be of essential import where the ore is at present considered too poor to smelt, because he believes that the quantity of fuel required will be relatively small, and, therefore, the cost of carriage low, and the power of heat great over inferior ores. In using peat, wood or other fuel which yields on distillation solid and gaseous combustible products economically, and in sufficient quantity for iron smelting and puddling, he subjects it to dry distillation, and then treats and uses the combustible products.

GLANCE AT THE GEOLOGY OF TANGIER, MOROCCO—No. I.

Sir,—As the attention of the civilised world is now being turned to the nearest part of Africa, and as it has been wholly overlooked during the past two centuries, perhaps a glance at the geology of Tangier, and the district to the west, may prove interesting. The climate claims peculiar attention, and Dr. A. Leared, of 12, Old Burlington-street, called attention to it in the *Lancet* of Jan. 4, last. Last winter a number of invalids were there, but Dr. Leared has in view the erection of better suitable accommodation. As it is there are five hotels where English fare and attendance can be had at moderate prices.

The north-west corner of Africa juts into the Atlantic Ocean, and a conical peaked sandstone rock, well ground by the action of the waves, is the last point of land above the level of the sea. That point is Cape Spartel, and an admirable lighthouse is built upon the elevated plateau above that rock. The whole place is a fit subject for scientific survey. From Cape Spartel on to Tangier runs a series of sandstone bluffs, almost perpendicular, showing the tremendous action of some former era. The sandstone is of several colours. In some instances of a pure white, in others tinged with yellow. The hills immediately on the shore have a thin layer of rich mould, from which crops up a rich vegetation. Protruding through the soil, sandstone boulders continually crop out, of a soft material, more easily pounded with the hammer than split with the wedge. Occasionally the road to Cape Spartel from Tangier shows a long line of smooth sandstone, at another a rock of granitic appearance crops out. Everywhere the water is tinged with rust, showing that iron is specially abundant. The sandstone bluffs continue to the north of Tangier, where the castle is built upon the heights, then the natural level shelves down till it reaches the level of the sea, beyond the south wall of the town. In front of the high walls to the north of the town there runs out an extensive reef of strata, all on end. It appears to be a mixture of fire-clay and ironstone. This reef shows many strata, all on end, and yet it is quite flat, so much so that small sprinkling of small stones would form a perfect bed for the Limmer asphalte to make a bowling surface. Behind the town the same strata appear, after passing over hills of sandstone.

On Nov. 6, 1872, I set out to survey these as a mere general observer, and the features described in my walk are such as were presented to my notice, perfectly free from precise technical description.

Passing out of the Soko gate, I passed on to my right as far as the gate to the Belgian Consul's garden—say 1100 yards, and the distance from the Soko gate to the sea is not more than 800 yards. From the Belgian Consul's garden I took track to the left, over the fields, past a well, and down to the plain. Along the margin of the hill front I found ironstone strata cropping out 2in. thick, and this I traced to the right, up the hill. Part of the soil like red hematite ore. I crossed the bed of the stream, and found ironstone and fire-clay plentiful. There was little vegetation on the hill now before me, and I proceeded up the bed of a deep gully, which had been washed by the heavy rains. Up a few paces I found two seams of ironstone, each ½ in. thick, cropping out of the clay; a space further on a seam of iron 1 in., ten paces further on a seam of ironstone 1 in.; then four paces, and then twelve paces, found at each a seam 1 in.; fourteen paces further found a seam of 2in.; two paces further a seam 1 in., which I traced eleven paces to the right; then nine paces on found a seam 1 in.; for next sixty paces several seams of troubled ironstone; then, close together, found three seams, each 1 in. thick; for twenty-two paces no trace of strata, then the surface is like red hematite ore; beyond that a fire-clay hill has several seams, all troubled; sandstone boulders commence; then a stratum of sandstone, which is rusty and heavy; then 1 in. of ironstone and fire-clay again. Arrived at a place where clay is being taken out on the left bank, then a seam of ironstone crops out 1 in.; then several boulders of sandstone lie in the bed of the gully, and extends across it. Sandstone strata again, and within four paces four good seams of ironstone, each 1 in. thick, with the bank like red hematite ore. Twelve paces on a seam of ironstone, 1 in. thick; ten paces, in a similar seam; and immediately above is a rude stone bridge, on which the upper path is carried. Rocks and earth have an ironstone appearance up to the hedge of aloes and prickly pears. I turned to my left, and went down hill along the bed of another gully. On my left the prickly pears and aloes grow; twenty paces, red earth crops through the mould, then white sandstone, with red earth beyond. For eighty-six paces found that fire-clay covers the strata; then a deep gully to the right; away up, a fire-clay hill; twenty paces on, a rusty sandstone crops out, 2in. thick, lying in cubes. Is it ironstone? One hundred and fifty paces brings to the public road, where two large stones lie conspicuous, with about one pace between them.

Seated on these stones, and looking to the right, several small seams crop out, and the surface has excellent specimens of heavy rusty stones. The ground is covered with metallic looking stones, which are like broken fossil lizzards. JOHN CRUICKSHANK.

172, *West George-street, Glasgow, July* 27.

THE THARSIS AND RIO TINTO COMPANIES.

Sir,—Under this heading there appeared in last week's Journal a most extraordinary article, full of gross misstatements and unwarrantable inuendoes, which I cannot allow to pass without question. It is no answer to the clear and distinct issues that I have raised to impute interested motives. The writer, in effect, admits my arguments and statements of facts, and vainly tries to reduce their force by inuendo. In this line of argument I will not follow him, but proceed to notice a few of the most prominent errors or perverse misstatement of facts.

If the writer of the article does not know that I am a manufacturing chemist on my own account, in Ayrshire, and on very bad terms with the Tharsis board and officials, I make him a present of the information. They refuse to sell me Tharsis ore, and I have had to buy from others. It is, therefore, my interest as a consumer that the Rio Tinto scheme should succeed.

In a former letter (which was published in a Glasgow paper) I think I proved from their own statements (and I even accepting all their anticipations as accomplished facts) that it would be financially impossible to carry this scheme through. This is a great misfortune, because if the Rio Tinto scheme fails, as I believe it must, thus heavily weighted, the price of pyrites will most assuredly rise to the consumers.

Let us look for a moment at what the promoters of the Rio Tinto Company have offered to the public. They offer the freehold of the Rio Tinto Mine for 4,500,000*l.*, just as it at present stands, or, rather, as they acquired it six or eight months ago. This concern, according to their own report by Dr. Forbes, lost, for 1872, 16,512*l.* During the same year of 1872 the Tharsis Company paid to their shareholders the sum of 320,000*l.* as divisible profits, besides very large writings off. The promoters of the Rio Tinto scheme insist upon making a comparison between their scheme and the Tharsis Company. These are the facts of what each concern did actually accomplish in 1872, and it will be a simple question of proportion—If Rio Tinto, with a loss of 16,512*l.* is worth 4,500,000*l.*, what is Tharsis worth with a profit of 320,000*l.* a year? There is a clear and distinct comparison for the Rio Tinto promoters to study! and there can be no doubt that it is the exact position of these two concerns at the present moment!!

Dr. Forbes no doubt proposes by certain extensive alterations, which will cost a great deal of money, to convert this annual loss of 16,512*l.* in a *very good* year into a gain of 60,000*l.* a-year in even *very bad* years; but, in my opinion, his proposed remedies will not be effectual, and the anticipated profit will fall far short of his expectations. This, and the railway, and the uncovering of the mine, will all require a very large expenditure of capital over and above the 4½ millions which is to be paid for the mine in its present state.

There are so many errors and misstatements in this paper that it would be sheer waste of your space to quote them. He asserts that their railway will cost less than Tharsis railway cost five years ago, when everyone knows that iron, labour, and material of every description now will make the costs at least one third more. Look at the actual figures. Tharsis railway, 30 miles 4-ft. gauge, cost about 240,000*l.*, pier and all: Rio Tinto, 50 miles, 775,000*l.* The one cost (say) 8000*l.* a mile, the other 15,500*l.*, or nearly double, and a narrower gauge. The writer also insinuates that the Tharsis ore is all raised by shafts, when it is well known that the railway enters the bottom of the open-cast through a tunnel, and the ore is loaded at a cost of under 1s. a ton into railway wagons, and never further handled, but deposited in the hold of the ship by steam cranes on the pier at Huelva.

The same remarks apply to the assertion that metal-works can be erected in this country at a much less cost now than they could three, five, or twelve years ago. But in this Rio Tinto scheme there is no capital for metal-works, or, indeed for that matter, even to buy the mines. Some providential arrangement is evidently believed in whereby capital is to be showered into their laps when wanted. There is, however, a marvellous confession of weakness and terror and want of faith in the following lines:—"But to expect that at the present prices of 9s. 10d. per unit for copper, and 7d. per unit for sulphur, either the Tharsis or any other similarly situated company can pay dividends is simply absurd." No doubt from their point of view it is very absurd, and if they happened to be able to ship ore at the present moment it would, they admit, be an impossibility for them to get little more than "the amount payable for freight." Hence their helpless position is made a point of devout gratitude to Providence that they are restrained mercifully from realising a loss. It is, no doubt, very absurd that during these deplorable times the Tharsis Company should pay 10, 20, and 40 per cent. for the past three years, and I have not the slightest doubt they will continue to pay 40 per cent. when Rio Tinto pays nothing.

I said in the published letter to which this writer refers that I considered it a mistake of policy to allow the secretary of the Tharsis Company to notice this absurd scheme; I did not say that there were any mistakes in the published circular. In my opinion, the Rio Tinto scheme was so heavily weighted that it was certain to sink like lead, and never would float, that the secretary of the Tharsis Company might judiciously have left it to its fate.

London, July 30. W. HENDERSON.

CUIABA GOLD MINING COMPANY.

Sir,—This company is ordered to be wound-up under petition of the secretary, who claims for salary and office rent 800*l.* This company has spent upon dead work and administration in Brazil only 1200*l.*, about half as much again that is spent upon Rossa Grande in one month; yet they have taken out from the old workings whilst the dead work was going on, and from the lode, gold to the value of 920*l.* One of the lodes has been fully exposed for some time, and according to the secretary's letter to the shareholders, under date Sept. 17, 1872, work was resumed there, and the stone yielding ½ oz. of gold to the ton, which even with the present small stamping force should give a profit of 1000*l.* per month. It is to be hoped the liquidators will bear these facts in mind, and not allow such a fine property to be disposed of for a mere nothing.

July 28. A SHAREHOLDER.

MINING IN COLORADO—ROGERS'S PUMP.

Sir,—In common fairness I consider you are called upon to insert the enclosed remarks, which have been published in the *Central City Register* of Colorado, in answer to the letter from your correspondent, Mr. H. B. Grose, in the *Mining Journal* of May 24.

Central City, July 9. A SUBSCRIBER.

MR. GROSE, AND AMERICAN EXPERTS.

The London *Mining Journal* is one of the largest newspapers in the world. It makes a speciality of mining in all countries where that business is carried on, has a multitude of correspondents, who are supposed to represent truthfully the condition of the sections they are writing from, and proposes at least to give definite and thoroughly reliable transcripts of the various fields of mining industry throughout the globe. Mr. H. B. Grose does [some of] the business for Colorado, and here is a paragraph from his last letter, published under date May 24. He says:—

"When I left Central City the machinery was started in the Bobtail tunnel for draining the water below that level, which I should have mentioned before this if I had had any confidence in its answering the purpose. But as the machinery was the invention of the manager, who is very presumptuous in his own views, I have waited the result, and I am sorry to say that my predictions have been verified, as I have been informed that the whole thing has broken to pieces, all the men discharged, and the water running out of the tunnel, which must have cost many thousands of dollars in putting in, and now they are as far behind as ever, when good machinery might have been put in at one-half the expense that this has cost, and would have drained the mine to any depth, and now I fear the mine will be again abandoned, which will be much against Central City, as mining in that district is going down as fast as it rose up. It cannot be wondered at, to see the useless and wasteful expense that is thrown away in the foolish erections of machinery and the bad working of mines by American experts, who will ruin every mine they have the power to manage, let them be as rich as they may."

We credit the editors of the Journal with honest intentions in giving these statements the wide-spread publicity which their paper conveys, but candor compels us to deny their correctness, and to give Mr. Grose's wilful and malicious falsification a slight airing. Mr. Grose would have mentioned the placing of the machinery in the tunnel if he had had any confidence in its answering the purpose, or, in other words, he had condemned it in advance, simply because it was an innovation of so decided a character upon the ancient usage that no expert of Mr. Grose's exalted standing could for a moment think of risking his reputation by an endorsement of it, or by failing to cast it out among the ridiculous follies of the age. He hated the manager most cordially; not merely because he happened to be an American, but because he refused to give Mr. Grose a situation about the works which he was entirely unfitted to fill. Naturally enough, having quarrelled with Mr. Rogers, it was wonderfully easy to quarrel with his machinery also. He is sorry to hear that his predictions of the result have been verified, but he rolls that morsel of revenge, "the whole thing has broken to pieces, all the men discharged, the water running out of the tunnel," into print with a relish that is not by any means to be mistaken for grief. But it is not true, Mr. Grose, and if your informant knew anything at all about it, he must have known he was telling you a deliberate falsehood. The whole thing has not broken to pieces, nor any part of it; the pump is not a failure, but a success, as great as any ever achieved in the line of inventions for raising water out of mines: the men have not been discharged, nor has the work been stopped since the original commencement, except for a few days for the purpose of extending the smoke stack of the boiler further up the shaft toward the surface. But you were perfectly right in one particular, Mr. Grose, which saves your statement from the indictment of being a solid mass of falsehoods,—the water is running out of the tunnel in a steady stream.

Now, a word relative to the pump. Its cost at the manufactory was just $1700; fitted to the mine, ready for active operation, between $2000 and $4000. It has answered fully every expectation of its inventor, has required no repairs, and has never ceased to perform its regular duty of discharging from 300 to 400 gallons of water per minute from the shaft into gutters of the tunnel, and is capable of throwing 600 gallons when so much is required. The cost of placing it in the mine is less than that of any other invention. It can be raised or lowered at pleasure. It occupies less than 4 ft. of surface room, and is operated at a trifling expense. Mr. Grose would have had a Cornish pump put in.

Before the tunnel was built the Black Hawk Company fixed one of these Cornish pumps into their mine, from the surface, of course. It cost them $40,000 to get it in running order, and, perhaps, $10,000 more to keep it in repair the first year. An estimate as to the expense of refitting it for present use—for it is still standing—recently made by an expert machinist, was about $27,000. The general experience of our miners with this class of machinery has been invariably of the most unfortunate character. It is always getting out of repair, always getting knocked to pieces by exploding blasts; it takes an age to set them for work, and a mint of money to keep them at it. For these and other sufficient reasons Mr. Rogers concluded not to buy a Cornish pump. As to the expense of building the tunnel and setting the new machinery now running so satisfactory, Mr. Grose will be delighted to learn that the entire sum expended for the whole work, tunnel included, was nearly $10,000 less than the amount paid for a single pump of the order he would have had Mr. Rogers put into his mine. So much for his anathema of the man who "is very presumptuous in his own views" and the results achieved.

Nor are the mines of Central City going down as fast as they rose up, Mr. Grose, as you would have the English readers of the *Mining Journal* believe. They were never in a more prosperous condition, never richer or more abundant in yields.

He has a bitter fling at the recklessness, ignorance, and general stupidity of American experts, this Mr. Grose, which we do not care to answer in kind. We simply invite him to look over the letters he has written to the Journal, and re-read the one published some months ago, wherein he lampooned and denounced every English superintendent then managing mines in Colorado in even harsher terms than he has applied to his American cousins in the extract before us. It is very evident from the ear marks of this very obstreperous animal that he is suffering for a superintendency of some kind for the display of his transcendent engineering abilities, and if neither American or English companies can be brought to a sense of their duty in this matter, why, he can at least abuse them roundly in the columns of a great newspaper, whose editors are entertaining a slanderer unawares.—*Central City Register*, Colorado, July 9.

ENGLISH MINING—AND FOREIGN GOVERNMENT BONDS.

Sir,—It is a source of congratulation to us to recognise the general spirit of regeneration so fully displayed in the young and progressive mines of Cornwall, that we trust are destined hereafter to take the position of that decadence, which all regret, so evidently shaddowed in many of the deep and expensively worked concerns that now have to struggle under the crippling pressure of high wages, expensive fuel, and it is to be hoped exceptionally exhorbitant charges for machinery and materials. Amongst these promising undertakings what have we to recognise? Not surely Wheal Rose, when it is announced that the resident "Baronet" has relinquished his holding and stopped Poldice; the latter thoroughly submerged "Gwennap." Mining in this district is not likely to relieve poor rates, nor will emigration tend greatly to draw from its sparse population. We, therefore, would suggest manufacture instead of mining, for enterprise and *esprit* are wanting there! We hope, however, that the Perran Wharf will receive its full share of forest support.

The late Capt. Charles Thomas observed once to me that it is easy to define a mine wherein yield will not compare with costs of extraction, but far more difficult to define when it will be found paying quantities—*i.e.*, there were always hazards in prognosticating success whenever the ground stood unexplored, and the best failed to represent the sources of wealth from which future supplies had to be drawn. Yet, under all circumstances (all Practicals admit) the career and success of that gentleman leaves behind him an example for energy, integrity, and progress seldom now-a-days met with in the new and reigning school of self-elected miners, who they anticipate results ere the ground be opened, instead of applying that earnest and searching industry which constituted the leading element in a "generation" all but absorbed in the lapse of time, of which the only remaining types are the Messrs. Joseph Vivian of Camborne; Thomas Treweeke, of St. Ives; John Tonkin, of Redruth; John Nancarrow, of Camborne; and John Burgan, of Helston. These gentlemen recognise legitimate mining, and we hope that success will follow their endeavours to promote the interests of the adventurers, even under the conflicting elements of high wages, costly fuel, and unheard-of charges for machinery and materials. We certainly look for success in shallow and comparatively young progressive mines, and, among the rest, we enumerate South Condurrow, West Godolphin, Balmynhear, Lovell, Lady Rashley Consols, Zennor Consols (of which we are buyers at 5*l.*), and East Ballesw

We now refer to the depreciation that has occurred in Foreign Government Loans, taking the prices ruling on Jan. 22 and July last, and it will be seen that the fall in prices of British mining insignificant when compared with Foreign Government Loans. The could not have been more than one half-yearly dividend paid, yet depreciation in commercial value of about 140,000,000*l.*, on Jan. exceeded 13,000,000*l.* sterling:—

Bolivian, from 60*l.*, fell to 38*l.* per 100*l.* bond.	
Chillian, from 2 to 4 per cent.	
Costa Rica, from 60*l.* to 52*l.* per 100*l.* bond.	
Ditto, 1872, from 67*l.* to 56*l.* per 100*l.* bond.	
Egyptian, from 2*l.* 10s. to 4*l.* 10s. per 100*l.* bond.	
Honduras, 1867, from 22*l.* to 15*l.* per 100*l.* bond.	
,, 1870, from 24*l.* to 17*l.* per 100*l.* bond.	
Italian, 1864, from 64*l.* 10s. to 59*l.* 10s. per 100*l.* bond.	
Italian Railway, from 68*l.* to 64*l.* per 100*l.* bond.	
Italian State Domain, from 91*l.* to 88*l.* 10s. per 100*l.* bond.	
Mexican, from 18*l.* to 15*l.* 10s. per 100*l.* bond	
Paraquay, 1871, from 68*l.* to 36*l.* per 100*l.* bond.	
,, 1872, from 62*l.* 10s. to 32*l.* 10s. per 100*l.* bond.	
Peruvian, 1870, from 75*l.* to 71*l.* 10s. per 100*l.* bond.	
,, 1872, from 67*l.* to 59*l.* 5s. per 100*l.* bond.	
Spanish Three per Cent., from 26*l.* 17s. to 19*l.* 5s. per 100*l.* bond.	
,, Quicksilver, from 81*l.* to 74*l.* 10s. per 100*l.* bond.	
,, Lond, from 79*l.* to 59*l.* 10s. per 100*l.* bond.	
Turkish, from 73*l.* 5s. to 69*l.* 5s. per 100*l.* bond.	
Uruguay, from 82*l.* to 78*l.* per 100*l.* bond.	

These but represent a few of our foreign engagements, yet sad as is the decline in British mining during the current year, still the depreciation of Foreign Loans surpass in amount tenfold the loss upon this department of our home enterprises.

32, *Fleet-street, July* 31. TREDINNICK AND CO., Dealers in Stocks and Shares.

SPECULATING IN FOREIGN MINING SHARES.

Sir,—Although a "Mining Engineer" has the presumption to lecture you upon your duty as a Journalist, I see nothing in his logic or his arithmetic to justify exception to your opinion (founded on trustworthy reports) that the resources of the Flagstaff have been scarcely tapped. The ore at present depth exhibits no signs of disappearing, and, as I understand, is in courses, not pockets, of ore. The development of the mine is not likely now to disappoint the adventurers. I do not think it is "gambling," even in a "parson," to place confidence in the now well tried management and happy experience of Flagstaff mining, and to prefer the reports of Mr. Maxwell to the groundless suggestions of an anonymous M.E. There can be, of course, no such thing as gambling in Cornish mines. "Mining Engineer" would have the parsons take to that as an honourable way of spending money. It is "mining and seeking for ore?"—*Verbum sap.* It appears, however, that there has of late been as much fluctuation in Cornish as in Flagstaff shares, and a decent old mine, in which I invested some time ago, is now, judging by the market price of its shares, worth half its former value—a fine field for the gambling parson, if not for "Mining Engineer."

The experience of Emma shows that far too much was given for it. Had it been purchased for a third of its price, worked carefully, and not picked out to pay high dividends on an enormous capital, it might have been now working to a profit—exploration keeping pace with outcome, and the value of the mine increasing like the Flagstaff. I do not suppose that "Mining Engineer" will venture to affirm that the Emma is exhausted, or that the shares are not worth 3*l.*

It is impossible to prevent such parties as "Mining Engineer" from showing off their wisdom, or trading on the fear of risk inseparable from nearly every description of mining investment, not excepting Cornish shares.

July 28. BONA FIDE INVESTOR, NOT A PARSON.

THE RELATIVE POSITION OF MASTERS AND MEN, OR EMPLOYERS AND EMPLOYED.

Sir,—Permit me, through the medium of your valuable and practical Journal, to which I have been indebted for more than 20 years past for a great many really useful suggestions and ideas, and for the kind recognition I have frequently received in being favoured by insertion of my letters and propositions on various subjects, intended for the benefit of all around me, particularly for the working classes (whose interests have at all times been advocated by the *Mining Journal*), to add to my two former letters a practical proposition on the arbitration and settlement of disagreements between employers and employed, in place or substitute for past unfortunate strikes, and derangement of works, &c., which have really done no good to anyone, except it be to mischief making agents, whose interest it has been to stir up strife between masters and men, who should be in co-operation, and a mutuality of interests and benefits be established, on the principle of fair-play and even handed justice, one towards another.

It was with sincere gratification that I read the leading article in the *Times* of July 21, on the termination of the London builders' strike, by the judicious concession of the employers. Having for more than 30 years been closely associated with masters and men, as a leading manager on general works, I am prepared to endorse the general opinions expressed by the writer of the article referred to. To avoid or prevent any more strikes, I consider that the best system which can be permanently and generally introduced is that of establishing (wherever it is possible to do so) fairly remunerated task or piece work for labour well and truly performed, regardless of any specified time or number of hours to a so-called day's work, which is no real standard, for it is certain that a quick and clever trained workman or labourer will do, in many cases, nearly, if not quite, double in quantity, and better in quality, the work or labour done by slow or untrained hands, who, under the present system, expect to be paid the same rate or equivalent of wages as the better men for a day's work, so that, in positive fact, there is no real inducement or encouragement to perfection or superiority of working or labour. I am aware that there is a diversity of opinion expressed on the subject of piecework remuneration, but in all my experience amongst many thousands of working men I have never heard one reasonable demur or objection to it, except it was from men who knew and felt the system put their working powers and capabilities to the test, which they could not stand when compared with better or smarter working men.

To secure a regulated code of prices (or really good working of all kind and classes, all that is required is that the arbitrators or judges shall be men of practical experience, sterling honesty, and sound moral character for judgment and impartial decision. Such good and true men, for instance, as the clerks of works could be chosen for the building trades and its branches, as they are well acquainted with the wishes and wants of masters and men, and are thoroughly independent capable judges of works, the value, of course, varying in some degree in different localities. The task work code of prices could be arranged triennially, or once in seven years, by the judges; and any contention or disputed point between masters and men would be fairly decided, and do away with wretched strikes and their evils. All other trades or workings, mines, &c., could be similarly arranged by practical unprejudiced arbitrators, and peace and goodwill be permanently established by a fair representation and valuation of the labours and interests of the men. The masters and em-

employers interests are self protective, secure remuneration, and find a true level by upon fair competion, which is necessary to check grasping monopoly. The only really unrepresented men are the managers, who are, in fact, the directors of the working bees in the great industrial hive, and secure, if they do not produce, the profits for the employers or masters, at a nominal salary, much too frequently restricted to a payment far below their worth and value. The consequent results are masters become millionaires, and retire to their landed estates. The managers (in a great many cases) retire to the workhouse, or drag out a miserable existence outside. It is not fair, just, or reasonable to treat good, deserving managing men in such a way as this, as by the laws of God and man they are entitled to, and should receive, a reasonable share of liberal or handsome profits, gained mainly by their good management and direction. In conclusion, I trust no delay will occur in carrying out my propositions and suggestions. My motto is, "It is never too late or too early to do good," and it is my object to do good for all.

Bernondrey, July 28. W. AUSTIN, C.E.

CRENVER AND WHEAL ABRAHAM.

SIR,—I have read the letter which appeared in the Supplement to the Journal of the 19th inst., signed "Director of Crenver and Wheal Abraham United Mines Company (Limited)," and, with your permission, I will explain why I reluctantly spoke of the *abandonment* of the mines.

I lately saw in the *Times* the report of a case tried in the Court of Exchequer, in which Messrs. Willyams were the plaintiffs, and the company in question the defendants; and I felt sufficient interest about it to enquire into the facts, which turn out to be as follows: On Feb. 19, 1870, about a week or ten days before the company was incorporated, the directors entered into a provisional agreement with the present secretary of the company for the purchase by the plaintiffs of the Crenver and Wheal Abraham Mines and plant for 30,000*l.* in cash and shares.

The agreement was adopted and confirmed at two general meetings, and in April, 1870, the company took possession of the mines with the plant, and have been working them ever since. They paid Messrs. Willyams, by instalments, all the purchase money, except a balance of 1874*l.*, which they refused to pay, insisting that they were not legally bound by the agreement, although the directors and the shareholders had adopted it, and although they had got possession of the mines; and I am told by a person who was present at the trial that the company's counsel admitted all the facts, and did not dispute the debt, but simply relied upon "the legal question."

My conclusion, of course, was that the company had exhausted their funds. I could not imagine that respectable men who had the means of paying for the property they purchased would evade a just debt; and if "Director's" story is true, I should like to ask him why, in the name of common honesty, such a discreditable defence was made, and how he can justify himself and his co-directors either to the shareholders or the public? I think that he had good reason for not signing his name to his letter, and no one can wonder at his statement that "it is not possible to depreciate the shares in value, as they stand at so low a figure." What confidence can the shareholders or public have in such conduct as this? Will the directors inform the company at their next general meeting how much money has been wasted in this action? They employ three counsel to admit that Messrs. Willyams's demand was a just one; and merely ask that they might be heard to argue the pleasant point of law whether honest men can purchase a mine, take possession of it, and then refuse to pay for it!

"Director" states that they have 26,000*l.* uncalled capital. I was very glad to hear it, because I believe the mines to be deserving of further trial in depth; but he must excuse my informing him that a company which refuses to pay an admitted just debt is generally supposed to be insolvent, or something worse. R. SYMONS.

Truro, July 30.

MINING IN NORTH WALES, AND ITS PROSPECTS—No. II.

SIR,—The classes of rocks in which the most prolific mines of lead are found extend from the granite all the way up through the primitive and metamorphic rocks into the secondary division, culminating, one might almost say, in the carboniferous period. The metalliferous belt of North Wales extends from the granite to the carboniferous inclusive. And within that area the best mines of the past have been found, and of the future are at present indicated, and therefore, if exceptions can be taken, it must be assumed to be from local considerations, and not from general geological objections, which, if such be valid, there ought not to be any difficulty in pointing them out. But if produce and profits are any criterion of value in respect of development made, or if those popularly esteemed features which are hailed as the precursors of future wealth are not peculiarly falacious in respect of mines in this part of the country, then they will compare favourably with the best mines of Cornwall at any period of their history. If certain minor differences, local peculiarites, were found to exist between mines here and those of the best established districts elsewhere, it would be important to consider whether such differences were not really more favourable than otherwise to the districts of North Wales.

So far as mining has been systematically prosecuted in the northern counties of Wales, it would appear that a greater proportion of successes have been met with than in any other parts of Great Britain, and greater prospects of future wealth abound than I have ever seen in any other part. When mineralogical differences occur in apparently similar geological formations it would be wiser to question the correctness of one's own conclusions regarding the phenomenon than to doubt the *bona fides* of the phenomonon itself. Take, for instance, the Mona Mines, in the Isle of Anglesey. What can be said of the vast masses of copper which were there found overlain by a bed of argentiferous galena of from 3 to 15 ft. in thickness, producing from 3 to 5 per cent. of lead, and from 50 to 60 ozs. of silver to the ton of lode stuff, a richer mass of argentiferous galena than was ever found in Cornwall, whilst the produce of copper which underlaid it was, subsequently, found to exceed for some time the entire produce of that prolific and far-famed county. But the metalliferous wealth of North Wales is not confined to the Isle of Anglesey; Flintshire and Denbighshire can each boast of eminently productive mines. The latter has its Minera, and the former is famed for its Tallargoch and also its Pant-y-Pwll Mines, in the Halkin Mountains, which alone is said to have netted a million sterling. Montgomeryshire has its Van and numerous progeny of Vans, some of which are rising into note by productive merit, and others from the prospects are expected to do so, and no doubt will. Then there is Aberdaunant, situate to the west of Van Consols, and immediately contiguous on the same great vein, which passes through the entire length of the sett unimpaired in width, quality, and capacity for produce, and indicating by bunches of ore in different places in the shallow parts of the mine of from 5 cwts. to 5 tons to the fathom what may be reasonably expected in depth from future developments.

If exceptional appearances baffle for a time the experience of men the fault may eventually be found in the latter, and it, no doubt, will be when the true interpretation of the former is arrived at, and, therefore, it would be the most culpable error of all to ignore such appearances by excluding them from the category of mining prospects. The datum of experience is analogy, and when that fails reason should be appealed to, and collateral facts and circumstances investigated by the light thereof, and all conclusions determined thereby, which in mining parlance is called "judgment." Mines of this class are beyond the pale of ordinary speculations just as much as they are beyond the range of ordinary experience, and lines in the rocks which alternately enrich and impoverish may be unintelligible hieroglyphics to even those whose unqualified condemnations would consign the whole region to the domain of oblivion. Carnarvonshire possesses mines of great merit, many of which are not extensively known because they are owned and worked by private parties—smelters and others—who have realised large sums from working them in the shallow parts, extracting ore as deep as they could work without erecting machinery for draining the mines below the respective adits. The prospects in certain sections here must be seen to be believed. It is scarcely credible by English mine adventurers, who are accustomed to spend so much money in following certain doubtful speculations in Cornwall and elsewhere, that such rich bodies of ore exist as are found here and are comparatively disregarded. Thousands of pounds are annually spent in Cornwall searching for mines on indications—so called—which would count for nothing in comparison with what are here, and would be immediately ignored by such a comparison, and expectations are kept alive in the minds of hopeful and confiding adventurers by prospects which, for the most part, owe their origin to a creative fancy, and nothing more tangible is ever realised. There are lodes here to be seen, opened from the hill side into settled rock, producing lead by the ton per fathom, and for scores of fathoms in length.

I am aware there is a prejudice entertained by some men against districts which are early prolific in their yield of ores, but such notions are merely the stock in trade of a few representatives of the old school, and are entirely rejected by men of progress and modern ideas. It is too often the case that superficial mines are indebted for that distinction to accidental circumstances—their falling into the hands of superficial miners. Before districts can be pronounced superficial in the ordinary acceptation of the term in their capacity for produce, the peculiarities which would thus result must be known and clearly apprehended—distinctions like those which fancy paints concerning metalliferous veins, as having been formed by different agencies and from different directions, as well as the arbitrary distinction which such vague theories lead to fail, to find a responsive sentiment in the minds of those who are wont to trace legitimately causes from their effects.

The mineralogical character of a district is its first striking and recognised feature by the miner, and next to that, and of equal importance to it is the geological order of its rock formations. The former may be regular and well outlined, but if the latter is not correspondingly so the nature of apprehended changes may be such as to excite the gravest doubts. But where the mineralogical outline can be clearly defined and is satisfactory, and the geological arrangement of the rocks is perfect or unexceptionable, then expectations may be entertained, and confidence reposed in the prospects as to the results of development, supported on either side by reason and analogy.

Llanrwst, July 29. ROBERT KNAPP.

MINING IN MONTGOMERYSHIRE.

SIR,—With a parable of oblique courtesy as a prologue, I again see your correspondent "Cymro," with that tenacity proverbial to his race, figuring nobly in defence of the Patent Self-Acting Dressing Machinery against an alleged vituperation upon them, supposed to have appeared in one of my letters, and in a strange admixture of wit, science, and sentimentalism, with Mr. Whalley and his Puseyism as a gap stopper, endeavouring to have your readers believe that the said machines are the greatest boon that was ever bestowed on a suffering humanity—at least, the mining portion of it; and that both myself and guide—by-the-bye, no mean dresser, and able to use those ancient weapons "the lue and gogrfach"—when perambulating the Llanbrynmair mining district went about—

"With eyes that hardly served at most,
To guard his master 'gainst a post."

But, Sir, let me here inform "Cymro" that being adepts in the art of seeing we had occular demonstration of various strange and peculiar objects in our tour, notable amongst which—and incredible though it may seem to your readers, Mr. Editor—was a cerwyn (Anglice, old-fashioned dressing-tub), with the despised, though indispensable, "lue and gogrfach," within that repository of new inventions at the Rhoswydol dressing-floors.

However, it is not my intention in the present letter to have anything to say as to the merits or demerits of the above indispensable auxiliaries to lead mining, but merely to call "Cymro's" attention to the fact that he has not yet proved that the brief remarks which appeared in my second letter were either fallacious or deceptive; and as "Cymro" seems to be a "go ahead" sort of fellow, with "never turn back" as his motto. I will not again ask him to re-read my letter No. II., but as a favour crave a reply to the following questions:—Has Rhoswydol during the last three years sold so much lead ore as it did a few years ago in one year? How many times since their erection (about three years ago) have the Patent Self-Acting Machines been renovated and remodelled? A reply to these will terminate this controversy, when, if "Cymro" desires, we will have something to say about "the greatest boon to mines and mining that this century can boast of." PEDESTRIAN.

July 29.

MINING IN MONTGOMERYSHIRE—No. V.

SIR,—"Coming events cast their shadows before them." Such was my impression on viewing the general activity prevailing at the Glansevern Mine, which has just been started near to the old Pantmawr Mine, and by the side of the turnpike that leads from Llanidloes to Aberystwith. I remember passing this way last summer, and visiting the mine when a very insignificant concern, but on our present visit things were materially altered. A nice bridge had been built over the River Wye, by which we were enabled to cross without having recourse to the primitive stepping stones, not a very pleasant job, especially when there happens to be a little freshes in the river, as there was at the time of our last visit, wet feet being the consequence, which gave me a reminiscence of my first visit Good buildings have also been erected, but these we pass, our object being to see the mine, where we were soon satisfied with what we saw, and although the external had improved so much since our last visit the internal was no ways behind. The appearance of the lode in each level had greatly improved, from each of which quantities of lead ore had been broken, If this mine continues to improve for the next as it has for the last twelve months it will rank second to no young mine in the Principality.

Adjoining this sett on the east is the old Pant Mawr or Nanty Mine. All was quiet here. Whether the old mine has been robbed of all its treasures it is difficult to say.

South from here about a mile is the Lighlen-las Mine. At the time of our visit they had hardly got into working order, the mine having been stopped for a long time. The prospects here are very encouraging, and, doubtless, ere long regular returns will be made.

East, and the next mine we arrive at is the Geifron Copper Mine, at present suspended. This sett, we are told, has been amalgamated with the Gwestyn, which adjoins it on the east, now known as the Gwestyn Consols. Here, again, is a large and doubtless valuable sett, being little better than trifled with, there being but six men at the present time employed in driving an adit level. There are several known lodes traversing this sett, prominent amongst which is the Van. From what I could hear it is the general opinion of all the mining men of the district that this sett is one of the best around Llanidloes, but unless more energy be displayed in its development it were better they were without the grant than with it.

Again east about a mile, and we reach the Aberdaunant Mine. This mine I have seen described several times in the Journal, therefore it need not again be particularised by me. However, I went through the mine and saw for myself some splendid courses of ore, not quite so rich as I had seen described in some places in the Journal, but quite equal to what I had expected seeing, and verifying in every respect Capt. Toy's report, which I had taken particular notice of for several weeks prior to my visit.—*July* 30. PEDESTRIAN.

MINING IN MONTGOMERYSHIRE.

SIR,—I should not have noticed the observations of your correspondent, "Pedestrian," but for the misstatements, both inferential and direct, which he makes respecting the Rhoswydol Mine, which is under my direction. In the first place, he never had permission to visit the mine, and he never has visited it during the day, to my knowledge nor that of the resident agent or dresser. He, however, professes to be posted up in his subject by a "superstitious guide," who if he happens to be wrong will surely get the blame. Who told "Pedestrian" that Rhoswydol was once very rich? True it is there was once a very productive lode; sometimes it yielded as much as 8 tons to the fathom. But the shareholders have informed me over and over again that, notwithstanding the fact that over 4000 tons of ore were taken away, only a dividend of one solitary 2s. 6d. was ever paid! Let "Pedestrian's" superstitious informant explain how this occurred. There was then no "elaborate" or patent dressing machinery there. And let him further explain how the "rich Rhoswydol" came to grief then, although an expenditure of some 30,000*l.* was incurred in opening the mine. I quite expected that "Pedestrian" would have furnished the proofs he asserted he could give that the present dressing appliances had nearly been the death of Rhoswydol. This he cannot do, unless he can prove that a saving of two-thirds of the labour cost in dressing, and a considerable quantity of ore, which would otherwise go to the river, sufficient to pay the remaining third of the cost, would have that fatal effect. Should "Pedestrian," or anyone who has been influenced by his random statements, doubt that the patent dressing machinery has done the opposite of proving fatal to Rhoswydol, let them consult the books of the company.

Then, again, it is untrue that "Rhoswydol has of late been getting sadly into the shade," for of late it is getting nicely out of the shade. True it is the mine is not dipping into the pockets of the proprietors, as it has hitherto done, to the extent of several hundreds per month, but is actually paying its way, and leaving some profit, owing entirely to the arrangements for dealing with the ore stuff with the least possible labour cost, principally the dressing machinery, which almost entirely dispenses with labour, the whole arrangement of which has been designed (and successfully) to accomplish. Then, again, as to the underground operations. The suggestion that a little more attention should be paid to them is inferentially untrue. Everything has been done that was possible to explore the mine and lay open the ore ground; every visible indication has been (during the past two or three years, and possibly before) thoroughly tested, and with both skill and perseverance. This I say to the credit of those who have chiefly directed the underground work.

And now, Sir, I must leave "Pedestrian" to his "superstitious guide," and advise him before he undertakes to lead and instruct the public in all manner of things to take, not a little but a great deal more, care in getting himself properly informed on the subject on which he treats. Unless he does so the uninitiated will be led astray; and should he reply to this I would ask him to give facts and figures, and not superstitious fancies and random guesses.

When "Pedestrian" has finished his series of letters, I dare say there will be some nice little "bal" described among the lot which the public may buy cheap, if enquiries are only made in the right quarter.—*Aberystwith, July* 28. GEORGE GREEN.

BRONFLOYD MINE, AND ITS MANAGEMENT.

SIR,—My attention has been drawn to a letter in last week's Journal, signed Thomas Kemp, who, it seems, is not very well pleased with my half-yearly report to our meeting of July 10. What irritated him to write the letter was, I believe, my stating that the mine had been worked in an unminer-like way for about 18 months previous to my appointment. I beg to state that such is a fact, and no practical miner can deny it, as the mine speaks for itself. Furthermore, I have no doubt such will, if necessary, be vouched by one and all of the mineral agents who have inspected the property within the last two years. Another thing he refers to is that "I promised last January to raise 250 tons of lead ore in the then ensuing six months, and have not fulfilled my promise." Still the ore is there; and allow me to inform him, and all the readers of the *Mining Journal*, that I intended then to pick out and send to surface all the lead orestuff which might be broken, and to leave nothing but the waste on the stulls to lift the men up to the roof of stopes; but I soon found out that I could not do this without much extra cost, burying, too, and for ever in the waste a great deal of the most brittle and solid prills of lead ore. Besides that, the lode (which you must know is about 4 fathoms wide) is disseminated throughout with ore, so that I could find hardly a stone without ore in it; consequently there is left quite three-fifths of the product of the mine under the men's feet now, which, as I said in my report, will be brought away after the stopes are carried up in any one level high enough. And, I beg to add, that the men could not reach the backs to bore and blast the ground if I had taken up more of the orestuff than I did. Further, Captain Kemp states that there were 200 tons of lead ore in broken stuff underground and on surface when he left the mine. My estimation of the ore in broken stuff so left underground at the time was at the utmost about 14 tons. The miners (and they are very good judges) all say that it was no more than about 12 tons, and they will testify to that now. The ore dresser's estimation of the ore in broken stuff on surface was 8 tons, making a total of 22 tons. Further comments on Capt. Kemp's letter is, I think, needless.

Bronfloyd, July 31. JOHN DAVIS, Resident Agent.

BRONFLOYD MINE, AND ITS MANAGEMENT.

SIR,—In the Supplement to last week's Journal I observed a letter by Capt. Kemp reflecting upon the management of Bronfloyd Mine. If Capt. Kemp is particularly anxious to let your readers know what an eminent miner has so long lived amongst them unknown and unnoticed he will, perhaps, be glad of the opportunity of making his accomplishment as a miner better known by answering the following questions referring to his management of Bronfloyd. Did he at one time dial a rise to meet the No. 3 shaft then being sunk from surface? How far was the rise from its proper place? Was the shaft holed into the level he was rising from before he found out his mistake? Did he afterwards report that the rise met the shaft as straight as possible? How much did that blunder cost the company? Did he not sink the last draft of the new engine-shaft in such a manner that it was found impossible to carry the pitwork to the bottom of it? Did he not work the mine as an open quarry until it had at last become quite dangerous? Was not the masonry arch built against his judgment, and according to the managing director's designs and strict orders? Was this arch not made just in time to save the mine from becoming a complete ruin? Does he know that the wide portion of the lode which he left unworked, and which is now of itself falling continually by scores of tons at a time upon the masonry arch, contains ribs of ore 3 and 4 in. solid? Did he not represent upon his cost-sheets that the stopes were working by the fathom, whereas, in reality, they were working at their leisure, and paid by the day?

It is right to add that Mr. Balcombe, the managing director, has for a long time been unable to go under ground owing to a serious accident he met with long ago. It is, however, generally admitted that his foresight in having the large masonry arch referred to built in time saved this valuable property from becoming a complete ruin, and very possibly the grave of many of the miners. This is what some people are pleased to call an economical system of mining, and for which the Bronfloyd property has of late been doing penance, while it is going through a tedious but sure process of being brought into something like scientific order

While Mr. Kemp is at it he would not, perhaps, object enlightening the public as to the promises he made to the shoreholders of Nant y creia? How far has he redeemed such promises? SHAREHOLDER.

NANT-Y-MWYN SILVER-LEAD MINE.

SIR,—At the great Nant y Mwyn Silver Lead Mine, on the last Friday in June, all the miners refused to take their bargains, in consequence of a disagreement with the manager. The miners having left for the Glamorganshire Ironworks, the manager was desirous that they should return, last Friday being their last pay at the mine; but, to his great disappointment, when the miners came for their pay, not one of them would stop at Nant-y Mwyn, but again returned to the Glamorganshire Works. The great Nant-y-Mwyn Mine has not been at a stand since the reign of King Charles I. The neighbourhood at large are in hopes that the company will soon make arrangements to put the old mine at work again, as it is a great pity that such a good mine should be idle from want of a proper understanding between the men and the management. MINER.

Llandovery, South Wales, July 28.

THE NEW SILVER DISCOVERY AT CALLINGTON.

SIR,—Two or three weeks back notice was drawn in your valuable Journal to the fresh discovery of silver in this district, and asking for further information. I have ascertained by a personal inspection that what was then stated is near about the fact, and that the mine where the rich mineral was being raised is called "The Lady Ashburton," so named after the noble owner of the property, having several lodes of tin, copper, and silver-lead, and is in 6000 shares. The lucky proprietors do not appear to be making any stir about it, but are well aware they have already a paying mine, and as depth is gained feel assured of handsome returns, equal to those formerly obtained on the same lode east of this, when many thousands in value were raised and sold; from all appearance they may safely bide their time. If this find had been made in Utah or Nevada it would ere this have been on the London market at a fabulous price. The lode working on is about 4 ft. wide, with a leader of 6 to 8 in., carrying "fahlerz," a combination of grey and yellow copper ore, rich in silver, disseminated through the one, and as they are but 4 to 5 fms. from surface, with the lode improving in going down, dipping east into this sett, every fathom sunk it is considered will yield more of the grey ore, with a higher percentage of silver. They are dressing up a parcel of ore evidently rich in silver. Dr. Serjeant, of Callington, before alluded to, has for very many years given his attention to this valley on the south side of Kit Hill, and it is to be hoped he has now in view an ample reward for his perseverance. I ascertained that he will be pleased to reply to any enquiries, or information may be obtained at the office of the company, 22, Princess-place, Plymouth. ARGENTINE.

CAMELFORD COPPER DISTRICT.

SIR,—The thanks of speculators are certainly due to your correspondent who, under the above heading, gave a warning that they should not rush into new concerns simply from their proximity to the St. Breward Consols, for while the success of that company will be the result of a careful selection of a mineralogical site, which includes in its area unmistakeable evidence of the existence of copper deposits, yet, as he implies, it does not follow surrounding properties will be equally rich. In the present state of copper mining, when new properties must be looked for to keep the yield, and when there is such a disposition to embark in them, the suggestion of your correspondent is certainly well timed. SPECULATOR.

Nuneaton July 28.

ST. BREWARD CONSOLS.

SIR,—While thanking Mr. Ennor for his opinion, so favourably expressed Supplement to last week's Journal, as to the value of this property, and which thus acknowledged only as a matter of courtesy to an eminent authority, the opportunity is taken to inform him that he is wrong in considering the capital of the company to be 62,000*l.*, called up. The capital stock of the company is 62,000 shares of 1*l.* each, fully paid up, having no further liability, of which are issued a certain number sufficient to meet the requirements of a full development of the property. Further issues of shares will be made as exigencies occur. A gentleman of Mr. Ennor's position in the mining world should be careful in the choice of expressions, which may create misunderstanding and distrust; and, therefore, when he is in-

formed that the payment for the property to the vendors is in fully paid up shares (and no cash), he will, I am satisfied, feel that the company comes up to his standard of legitimate mining, the more especially as he entertains so unqualified an opinion of its mineral wealth.—*July 29.* A Director.

WHEAL BARNARD MINE.

Sir,—The enclosed will speak for itself. Please kindly insert it.

Abbey Mount, Tavistock, July 29. Thos. J. Barnard.

Wheal Barnard, July 26.—We have now 70 tons copper mundic ready for treatment, and are breaking and raising rocks to-day that weigh over 3 cwts., giving 3 per cent. produce copper, besides the arsenic, silver, and tin. Let us put on more men and open up ground, and we could raise 10 tons per day. The lowest produce for silver of this stuff is 9 ozs. per ton, which gives by assay 12¾ ozs. after the arsenic is removed. The silver lode has further improved. I broke on Thursday 3 cwts. from the north branch, averaging 300 to 400 ozs. silver per ton, and to-day 5 cwts. from the south branch, worth at least 150 ozs. to the ton. These two branches are bound to come together as we sink, and at the junction we are bound to have a good deposit of silver; in fact, I expect when the two branches meet that we shall raise rocks of silver. We can only work with six men in sinking the shaft, which is slow work, so great care is required with the rich branche, but after sinking a few fathoms we shall be able to drive and stope the silver away at good speed. I can safely say there is not a man working upon the mine who is not earning a profit for the company, and rich as the mine is now I expect far greater things shortly. The 300 to 400 ozs. north branch and 150 ozs. south branch is a fair average of the quantity broken, but I could send you stones—picked specimens—several pounds in weight, that will give thousands of ounces to the ton.—J. Knott.

WHEAL BARNARD (LATE QUEEN) MINE.

Sir,—I admire the tone of Mr. Barnard's last letter in the Journal, and consider that he is acting wisely and well, and also generously, in offering the old shareholders an interest without a premium after having succeeded in bringing the mine to a successful issue. It is a novelty to see one and all agree upon the merits of a mining property. Different opinions have certainly been expressed as to Mr. Barnard himself, but I never heard anyone speak but well of the mine; and it occurs to me very forcibly, from what I have lately elicited, that if Mr. Barnard had looked after the working of the mine himself, instead of writing a lot of twaddle, many of us would have been better off.

Manchester, July 28. —— One of the Old Shareholders.

THE UTAH MINES.

Sir,—Rumours connected with the Utah Mines have been rife during the past week, to which, perhaps, little attention need have been paid had it not been confidently stated that, with regard to the Lost Chance Mine, Mr. Williamson, one of the directors, had resigned his seat on the board. This report became first current at the time that the last dividend was declared, leading to the conclusion that a disagreement on this point was the cause of the resignation. The shareholders are naturally very anxious to know the truth, and look for your powerful aid in the matter.—*July 31.* A Constant Reader.

[For remainder of Original Correspondence see to-day's Journal.]

Prevention of Colliery Accidents.

Mr. HERMON'S PRIZE ESSAYS.

Prelude.

An Essay on the Prevention of Accidents in Mines would be very incomplete unless referring to the general rules of the Acts of Parliament, and the special rules which are framed with the approval of Her Majesty's Secretary of State, and Her Majesty's Inspectors of Mines. As each rule is intended to prevent accidents, therefore I enclose them in their usually printed form (with my remarks on the margin), thinking they will thus be more easily referred to than if in manuscript; for the same reason I refer to the number of rules relating to suggestions I make in the course of this essay, it being understood that, as I approve of the rules enclosed, excepting where it is *expressly stated to the contrary, or an explanation is given*, no reference on the margin of any rule signifies my approval of that rule. This essay will also treat on subjects not mentioned in the enclosed rules.

[It is unnecessary to re-publish the printed copies of the "General Rules" given in the Act of Parliament, of the "Special Rules" officially sanctioned for the district, and of the "Special Rules for Sinking Pits" (which are those in use at the collieries of the Sharlston Coal Company) prefixed to the essay, but the suggestions embodied in the remarks are subjoined.

As to General Rule (5), he remarks that drop-gates would ensure the proper fencing of a drawing shaft. He thinks (Rule 6) that "all shafts should be lined, unless the Inspector directs otherwise." It may (Rule 8) be found desirable to have a separate road for persons to travel on, the Inspector deciding when such is needful. A brake should (Rule 12) be fixed to the *drum*.

As to Special Rules, he considers that it would be well (Rule 21) if in all cases of neglect of rules the offender were taken before the magistrates, not having the option of paying a fine. He thinks (Rule 38) no boy under 12 years of age should work in a mine. In signalling (Rules 49, 50) it is advisable to have a bell at the pit-top, actuated by the same impulse as that in the engine-house, so that the banksman's attention is more particularly called to each signal. Drop-gates will (Rule 57) ensure the top of the drawing-shaft always being fixed. He thinks (Rule 62) the minimum strength of the sump cover might well be mentioned.

As to the Special Rules for Sinking Pits, he would add (Rule 13), that the engine-man must not leave his engine while men are in the shaft. It would (Rule 22) be better to have the head of the rammer made of brass or copper; the rule merely provides that they "must ram shots with stuff that will not strike fire with the rammer."]

Essay on the Prevention of Accidents in Coal Mines.

In this essay I will treat on the various causes of accidents to which miners are subject under the following heads, viz.:—

1.—Loose Discipline.
2.—Explosions of Fire-damp or Bi-hyduret of Carbon.
3.—Suffocation from the effects of Gases unfit for the Support of Life.
4.—Inundations or Flooding of Workings by a sudden Influx of Water.
5.—Falls of Coal or Roof.
6.—Accidents in Shafts.

1.—Loose Discipline.—This is so universal, and such a fertile cause of accidents, as to take my first attention, for whilst discipline is neglected accidents from all causes will occur, no matter what other precautions are taken. It proceeds from various causes, which I will enumerate thus:—

(A.) A manager who does not thoroughly understand the working of a colliery, and who will have no competent mining engineer or other person to take charge of the workings.

(B.) A manager or engineer or other person thoroughly understanding the workings of a colliery and giving the most proper orders, but not seeing that they are duly carried out.

(C.) Shortness of capital, which I may divide thus:—

(C'.) Those who have not got the money.

(C''.) Those who, having plenty of money, will not be induced to spend more than is obsolutely necessary to get the maximum quantity of coal, and who sacrifice safety by attempting to barely clear themselves from censure in case of accident.

(D.) The practice of giving colliers wages according to their tonnage, without some constant supervision, which practically causes the defect mentioned under head (C''), placing time for money.

Remedies must be applied to all these causes, as follows:—To remedy cause (A) a competent manager must be supplied; but under head (B) it appears that a manager must possess more than mere knowledge, for he must also have firmness and energy; and under head (C) it appears that let the manager combine both knowledge and energy they are of no avail without capital; therefore I am inclined to think that the person engaged in the commercial department should not take charge of the colliery department, because if he does safety is likely to be sacrificed in order that he may show a good balance-sheet.

A man may have a good knowledge of mining, but, at the same time have no energy or firmness, and so not be fit to see his orders carried out, therefore an examination of managers cannot *ensure* competent management, and I am of opinion that if the remedy for cause (D), to be next described, be carried out, the Inspector will be able to judge as to the management, and act accordingly.

Remedy for cause (D). Anyone acquainted with the character of colliers would not for a moment entertain the idea of employing them by the day, and even if that system were adopted the remedy would only be partial, owing to the ignorance and slothfulness of some men of that class. I should advocate the organisation of a competent staff of overlookers, say one for every ten or twenty men employed in getting coal (the number to be varied according as the colliery is more or less dangerous), from whom no work would be required during the working hours of the men whom they overlook, except seeing that the rules and bye-laws of the colliery, and the orders of the manager or engineer, were carried out to the letter by the men under their charge; and I would make such overlookers remain with the men during the working hours, and be responsible for their safety. Every short period (say, once a week) each overlooker should meet the manager, or person duly authorised by him, at the colliery office, and give his report, which must be entered in a book, laid out in tabular forms, and kept there for that purpose. Perhaps the following form may convey a better idea of my meaning. The rules of the colliery should be *read* over to the overlookers, deputies, and fire triers, once every month, and *explained* if necessary.

Date of Report.

Period over which the report extends, from to
Name and address of overlooker.
Portion of mine overlooked.
Number of men and boys under charge of overlooker.

Questions.	Answers. Yes or No.	Describe to what extent.	Remedy applied.	The result.	Remarks.
1. Has any gas been found in your portion of the mine?					
2. Has the roof been on the weight?					
3. Are locked safety-lamps used?					
4. Have you been well supplied with Props? ..... Sprags? ..... Lids? ..... Brattice? ...					
5. If you have any complaint to make against any man, or men, state it in the remarks; also the name or names of the offending person or persons					

This form might easily have a better one substituted, but if it has conveyed any meaning it will have answered my purpose.

The quantities of air in the main intake and return, and also in each split, should be entered along with these reports, which must be open to the Inspector at any time, who will then be able to judge as to the fitness of the management.

The overlookers (if more than one) must not overlook the same lot of men between each report; thus, for example, if there are 10 overlookers, every eleventh report would be on the same lot of men by the same overlookers; this, I think, will prevent overlookers becoming negligent, as they will then check one another.

Separate copies of the reports of each overlooker should be fixed to the head gear of the colliery or other suitable place, adjacent to which the report refers, to enable all the men and boys to see exactly the state of the pit; and a time should be fixed when they may make complaints against any false report, and can see that the necessary alteration is made, after which each overlooker must keep his own report, so as to check the colliery report book in case of need. There should be a special rule made for these overlookers. The questions in the tabular form must refer to everything which might cause an accident in a coal mine; thus, amongst other instances in the tabular form already drawn up, there is no mention made of danger from blasting powder, and doubtless there are many other omissions, to prevent which an approved form should be printed for all collieries, and every question should have an answer affixed to it.

These overlookers* are not at all intended to take the place of the underground viewer (or the fire triers and deputies* as now required), who will have the same authority over everyone in the workings as at present, and I recommend that he should have a diary kept in a cabin underground, in which the fire triers and deputies must enter their daily reports, so that he may at once go to any particular place requiring his attention.

Collieries should be surveyed and plotted on a plan kept for that purpose once every half-year, and the plan should not be considered complete until the correct courses of the air, or ventilating currents, and all doors, stoppings, and slits, are marked thereon.

If the number of qualified persons necessary to enforce discipline be insufficient, then discipline will no longer exist. Her Majesty's Inspectors of Mines are not, in my opinion, sufficiently numerous, and I think there should be one Inspector for about every 100 collieries; this would ensure every colliery a visit from the Inspector of that district twice a year.

I think that in case of the Inspector, and manager, or engineer, &c., disagreeing about any matter considered needful for the safety of the miners—of course, excepting a breach of the rules—such disagreement should be decided by reference.

The Inspector's sanction in writing on the plans should be obtained in respect of all permanent new arrangements connected with the safety of the miners, and not actually mentioned in the rules, and no such arrangement should be altered without the Inspector's sanction; this would prevent many great blunders which are now being continually committed.

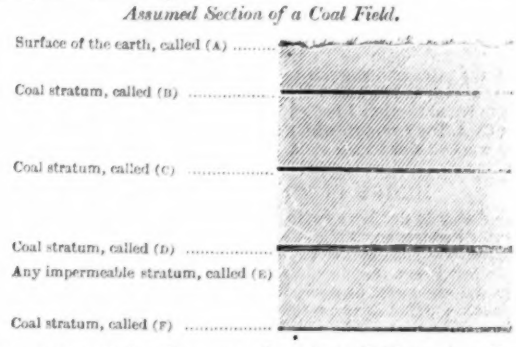
No. 2.—Explosions of Fire-Damp or Carburetted Hydrogen Gas.—Before seeking the remedy I will endeavour to examine into all causes (if possible) leading to explosions of this gas. The different natural agents tending to change the air in a mine—otherwise good—into an explosive mixture, I will distinguish thus:—

(A.) Sudden outbursts of gas.

(B.) Gradual filtration of gas into "wastes" or other excavated portions of the mine.

(A.) Sudden outbursts of gas. There appears to be a portion of gas in the mineral kingdom which is retained only under great pressure; now, if this be so, how will extracting a stratum—say, a seam of coal—affect this gas? The following sketch will render my explanation intelligible.

Assumed Section of a Coal Field.


Surface of the earth, called (A)
Coal stratum, called (B)
Coal stratum, called (C)
Coal stratum, called (D)
Any impermeable stratum, called (E)
Coal stratum, called (F)

B, C, D, F, represent coal, or any other strata liable to give off explosive gas on a reduction of pressure. Say that D is the coal being wrought, the result of extracting which is that the pressure on strata C and F is greatly reduced, or the pressure necessary to retain the portion of gas—before alluded to—in the coal of either seam is now represented by the resistance offered to it by the strata between C D and D F respectively, and not, as heretofore, by that between C A and F A respectively. The seam may, or may not, be affected by the extraction of D.

From this theory outbursts of gas are explained as follows:—The seam D being wrought, the pressure necessary to retain all the gas hitherto existing in seams C and F is reduced, and the liberated gas will find its way against the least resistance, in this case towards D. I will take first the gas issuing from C; all the cracks and interstices above D are, if the gas be sufficiently plentiful, filled with it, the roof of a mine being always in a more or less shattered condition, wall and cracked roof beyond and above it.]

[The author here introduces a section of a working face, with pack

If this gas were regularly given off into the wrought portion of the seam D the loss of life by explosions, from its ignition, could easily be remedied by ventilation; but it assumes suddenly a very dangerous aspect when the roof of the mine settles, or technically "weights," for the interstices in which the gas is stored are compressed, and it is forced in a body into D; a fall of the atmospheric pressure will also cause this gas to be given off in increased quantities; besides this, a portion of the gas made from the seam D will also take refuge in the roof, and this, without the aid of the gas from C, will be dangerous when the roof "weights" or the barometer "falls."

I will now take the gas liberated from F, which will force its way against the least resistance until it reaches an impermeable stratum (if such exist) between F and D (called E) of sufficient strength to resist the pressure of the gas in its then attenuated form, under this stratum it will remain until one of the following events happen:—

(A'.) The atmospheric pressure is reduced.

(B'.) In the course of working the stratum D, the mine extends over a place, perhaps it may be a "slip," in the retaining stratum (E) too weak to hold down the gas, and the result is an outburst.

(C'.) As the workings in D extend the boundaries of the solid coal become further and further apart until, as in the case of a bridge, the same section of girder will not sustain the same weight as the length or span of the bridge is increased, so the stratum (E) will not have strength to resist the same pressure as when the boundaries of the solid coal were nearer together, though, doubtless, in the case of E there will certainly be intermediate supports as the roof of D settles, and these may, to a certain extent, counterbalance the danger from this cause.

(D.') A time will arrive when the settlement of the roof will take place; this will cause a pressure on the floor of D at different places, and again compress the strata (naturally to some degree puffed up by the liberated gas from F) below, through which the gas has percolated, and now exists in a free state; thus the gas is forced to occupy less space, and consequently must exert a greater pressure, and if the stratum E, with its superincumbent weight between E and D, be not strong enough to resist this pressure an outburst of gas is the result.

(B.) Gradual filtration of gas into "wastes" or other excavated portions of the mine. The gas may come from the coal being wrought, or otherwise, and gradually fill the "breaks" or cracks in the roof, and the old workings (or perhaps the workings in use), until by a fall of the roof, or a "weight," or a reduction of the atmospheric pressure, or derangement of existing ventilation, it altogether overpowers the ventilation, so that the air in the mine is charged with fire-damp to the firing points. The ignition of these explosive mixtures is produced by the introduction of fire (unprotected by safety wire-gauze) into the workings by either of the following means.

(A.) By human aid, such as lighted candles, matches, blasting powder, defective safety-lamps, &c., and perhaps, in some cases, by sparks rapidly produced from a pick, or metal tool, striking against a hard substance.

(B.) By spontaneous combustion of substances met with in mines, and an explosion is the result.

I will now treat on the prevention of explosions. Doubtless the primary reason of all explosions of fire-damp in colliery workings is because there is not sufficient air to render it harmless (there will be no explosion unless the carburetted hydrogen equals 1-14th the volume of air); the question arises, is it not possible to supply this want of air in all cases? If the roof and floor of all mines were perfectly smooth and regular, and could be so maintained, I should say it was possible to produce such a ventilation as would render all explosions impossible, for then the only gas to be dealt with would be that regularly issuing from the seam of coal being worked, increasing only with the extension of the working faces and a "fall" of the barometer, but no such roof and floor are ever to be found, and the liability of either to break renders the ventilation of coal workings, especially deep ones, so subject to outbursts of gas from roof and floor as to make me despair of ever getting sufficient atmospheric air through the galleries of mines so as to mix with and dilute the fire-damp given off in these outbursts, not even if the air travelled at a fabulous rate, for the liberated gas and the ventilating air will both travel at the same speed, for they will both be influenced by one motive-power. There are even some cases where the gas is given off in such volume as, for a time, to prevent any atmospheric air from going into the mine, because the partial vacuum at the upcast shaft (necessary to produce circulation of air through the mine) is supplied by the outbursting gas.

[*To be continued in next week's Mining Journal.*]

* Perhaps the word "deputies" would be better than "overlookers," and if preferred can be read as such; but as it avoids confusing the deputies, as now required, with those now suggested, I prefer the word as written.

THE SOUTH MIDLAND ENGINEERS, AND THE COLLIERS' STRIKE IN SHROPSHIRE.

There was a meeting, on Monday, in Wolverhampton, of the South Midland Institute of Mining, Civil, and Mechanical Engineers, presided over by Mr. E. Jones, the President of the Institute, and at which Messrs. H. Beckett, W. H. Glennie, W. Blakemore, S. Fenn, J. Naylor, J. Laxton, T. Price, J. Ferridee, D. Davis, A. E. Dorsett, J. Eglington, and D. W. Lees (secretary) attended. Three new members were nominated for election at the next meeting, and arrangements were made for an excursion on Aug. 19 next into the Warwickshire coal field, to visit the works of the Bedworth Coal and Iron Company, and the collieries of the Hawkesbury Company, as to all of which cordial invitations had been given to the Institute.

The President announced that at the 80 or 90 pits belonging to the Lilleshall Company there was a partial strike. The new Coal Mines Regulation Act required that after the 1st of August all colliers should be paid either by weight or by day work, and not by measurement. It so happened that at three of the Lilleshall Company's pits a minority of the men had for many years worked by measurement. In consequence of the requirements of the new Act the company gave these men notice that after the 1st of next month they would have to work day work. Upon this most of the colliers in the company's service gave notice that they should leave in a fortnight, if after the 1st of August they were not paid by weight. As this would entail the laying down of weighing machines at all the pits, the company declined to do other than pay by day work. The result was the strike, with its attendant inconvenience to the iron and engineering departments of the company's concern, as well as to the sale department of the collieries. And now the engine-winders were meeting to consider whether they should not decline to take the responsibility under the Act of daily signing the entries relating to the safe condition of the machinery which was under their own direction. He enquired what was the practice in South Staffordshire as to these entries. From the replies made by Mr. Blakemore, Mr. Davis, Mr. Fenn, and others, it seemed that different practices prevailed; that in some collieries men were told off especially to examine the machinery and report the result in the books kept at the central office, the engine-winders being at the same time held responsible for examining all their machinery before they commenced work in the morning; whilst at small collieries the entries were made by the winders themselves. The President explained that he had applied to the Home Secretary for exemption in respect of the measurement practice at the three pits he had mentioned, and that Mr. Bruce, after sending the Government Inspector for the district to the place, declined to grant exemption. As to the entries, the difficulties of the Lilleshall Company were increased by the Government Inspector requiring that they should be made in books kept at the several pits, the Inspector declining to be satisfied with the books being kept at the central office.

The President and the meeting generally complained of the growing difficulties which surrounded colliery owners and colliery

managers by reason of the legislation of recent years. It resulted in an undue and unsatisfactory interference with the freedom of labour, and occasioned a great increase to the public of the price of the fuel. If the men should have to be paid by the statute ton, then a further considerable increase of the price of coal would be necessary, for where the coal had to be conveyed a great distance from the pits it was necessary, in order that the seller who had bought so many tons of coal should be able to make his returns upon that number, that more than statute weight should be sold to him as a ton. It was believed that very soon the men and the public would find that the Act was working to their disadvantage, and that their demands, united with those of the colliery proprietors would compel the Legislature to abandon not a few of the restrictions with which the industry was now trammelled.

INSTITUTION OF MECHANICAL ENGINEERS.

The Institution of Mechanical Engineers, which this year held its annual meeting by invitation of the Royal Cornwall Polytechnic Society in the county of Cornwall, commenced the proceedings thereof on Tuesday morning in St. John's Hall, Penzance, by the reading and discussion of papers. Mr. F. J. BRAMWELL, F.R.S., vice-president, occupied the chair, and among those present were Mr. C. Cochrane, vice-president, C. E. Amos, F. Miers, Newton, J. Miers, Carbutt, Lawrence, Murray, Pearson, R. Taylor, J. H. Collins, F.G.S., Ferguson, T. S. Bolitho, M. Beazeley, Fletcher, Vicars, W. Husband, S. H. James, A. Chenhalls, John Boyns, J. Bennetts, Maynard, Silk, B. Williams, J. Roscorla, J. G. Uren, W. P. Marshall, &c.

The CHAIRMAN, in opening the business, said that before they commenced he had an announcement to make which all present would regret, the fact that their president, Mr. Siemens, could not attend that meeting. He was at present in Vienna, representing English engineering, as the Chairman of the jury; and being further connected with the telegraphic conference, and also with the patent conference. Mr. Siemens had written a letter expressing his extreme regret that he could not be present, and hoping that all the members would do what they could to make the meeting as successful as their Cornish friends could desire. The reading of papers was then proceeded with.

"On the Mining District of Cornwall and West Devon," by Mr. J. Henry Collins, F.G.S., of St. Austell, communicated through Sir F. M. Williams, Bart., M.P.—This paper was read by the secretary (Mr. Marshall), and was illustrated by maps, sections, and examples of the rocks and minerals referred to. Mr. Collins detailed the various rock characteristics of the district under review, their geological position, the mode of occurrence of the mineral veins, cross courses, and flookans, and the general method of working. He thus gave a full statement of the chief facts in the occurrence of metalliferous minerals in the district, and in the mode of their attainment and utilisation. The annual value of the tin ore raised in the district had increased from 668,000*l.* in 1866 to 1,068,000*l.* in 1871—the former year being a period of great depression. The copper ore had decreased in value from 547,000*l.* in 1866 to 360,000*l.* in 1871—many of the mines having been worked out, and great influence being exercised by foreign production. The lead ores of the district averaged 8000 to 9000, which produced an average of 35 ozs. of silver to the ton, against 8 ozs. for the rest of the kingdom. The iron ores of the district, the deposits of which were very large and valuable, were only just beginning to be developed. A statement was given of the form of occurrence of china-clay and china-stone, and of the modes of their preparation. In conclusion, the miscellaneous mineral products were mentioned; and finally, the total yield of minerals in this county estimated at 2,000,000 annually.

Mr. RICHARD TAYLOR commented on the interesting points of the paper. In the course of his remarks he referred to the richness of the tin deposits of the deepest parts of Dolcoath (350 fathoms, or 700 yards, from the surface) and said some Cornishmen were sanguine enough to expect that the deeper the miner sunk the richer the tin would prove. He could not pledge himself to this opinion, though he hoped it was a well-grounded one. From personal reminiscences he spoke of the heat of the United Mines at 250 fathoms depth—the water 115°, the rocks so hot that you soon removed the shoulder if you leant against them, and the toil so exhausting that no man above 21 worked in the hottest levels, which were cooled and ventilated by means of constantly running rivulets of cold water conveyed to them from the surface. Mr. Taylor also referred to the lead mines of the county and their importance; and to the value of Cornish iron as an aid to the conversion of iron into steel by the Bessemer process. The iron ores of Spain, when that country should be pacified, and of Algeria, would compete with the resources of the county in this respect, and, as a rule, the brown hematites of the county were too silicious and have had to contend with inadequate means of transport. Mr. Taylor only hoped that increased means of transit would bring about the pleasant state of things predicted by Mr. Collins, and that augmented yield of iron would compensate for any falling off in tin and copper.

After a few appreciative words as to the paper from Mr. S. H. James and Capt. James Bennetts, Mr. Collins observed that the high temperature of the deep levels in the Gwennap district was not an unmixed evil—it aided ventilation. The lead mines would be developed with better means of transport. The bucks of the iron lodes had been principally worked, and the yield was more or less silicious because the stuff was not too judiciously selected; but men were prepared to crush (by Blake's stonebreakers) and wash, silicious brown hematite at 1s. a ton.

Mr. HUSBAND asked a question as to combed structure, which Mr. Collins answered. A fissure gradually became the place of deposit of crystals by aqueous agency, the crystals first clinging to the walls of the fissure. As new mineral deposits followed combed structures were formed, the deposits being mainly in pairs or on both sides of the fissure—the last and central space being the only single comb. Cavities found now were in course of filling; Bischoff, the great German chemist, and Mr. J. A. Phillips, by his experiments on the mineral waters of Cornwall, having satisfactorily established that all water percolating through mineralised districts is more or less mineralised. Mr. Collins went on to give the latest geological theory as to the formation of lodes.

Mr. TAYLOR described an immense cavity recently found in a Spanish mine, the sides incrusted with crystals; as also one in the Consolidated mines in Gwennap, which at one time existed to a much greater depth, but successive roofs had fallen, in and raised the floor of the cavity.

Mr. COCHRANE objected to the crushing of iron ore so as to go through a ½-in. sieve; and Mr. Taylor feared that the extent of crushing in order to get rid of all silicious matter would not be acceptable to ironmasters, except to those who used crushed iron ore. Mr. Head, a buyer of finely crushed iron ore, asked for the particulars of the Perran lode; and Mr. Collins assured the meeting that Perran brown hematite to yield 50 per cent., and red hematite to yield 65 per cent., could be crushed and cleansed at 1s. a ton—the crushing being effected for 4d. a ton. A hearty and unanimous vote of thanks was passed to Mr. Collins for his paper and remarks.

The next paper was "On Machinery for Dressing Tin and Copper Ores," by Mr. Henry T. Ferguson, of Truro. It minutely described the stamps, stamp-heads, gratings, perforations, &c., used for tin-stuff; spoke of the great quantity of slimes caused by the ordinary stamps, and showed how Husband's patent pneumatic stamps obviated this difficulty. These stamps were also explained and illustrated by plans, as were the old fashioned ones. Husband's stamps gave 140 blows a minute by each head, which crushed from 10 to 12 tons a day. Mr. Ferguson went on to describe the strips, the buddles (circular and otherwise, but especially the former as the more effective) with their revolving sweeps, and the division of the stuff into head, middle, and tail; the mode of conveyance of the stuff to the concave buddle, and the method of working it. Borlase's and the propeller knife buddles; tozing, to get rid of the fine particles: tapping, to keep up a gentle vibration, and further separate the ore; and calcining, or burning (with a description of Oxland and Hocking's patent calciner). The whole process occupied about 10 days, and by it the yield of 1 per cent. of tin in tinstuff at the shaft's mouth was changed to one of 95 per cent. The operation of re-working the slimes from the banks and beds of the rivers was described, as well as a self acting frame which can be worked by one boy. Mr. Ferguson showed how much care is needed to secure the largest available quantity of tin, so prone to be carried away in suspension in spite of every precaution, and then gave an account of Borlase's buddle and Dingey's pulveriser. The Red River yielded 30,000*l.* worth of tin, lost to the mines which originally raised it by the impossibility of preventing the escape of the tin in suspension. The spalling, hand-picking, sifting, rolling, jigging, sampling, assay, and sale of copper ore were next described. In 1872 the copper ore raised in Devon and Cornwall was 71,000 tons, value 284,000*l.*, while 10 years ago the quantity was two and a-half times as much. Mr. Ferguson explained by specimens the different stages of the processes of preparing tin and copper.

Capt. MAYNARD and Mr. TAYLOR briefly spoke. The last said that, until a recent period, the processes of preparing Cornish ores were very rude. Having dwelt on this point, and stated that he built the first jigging-machine in Cornwall, at the Consolidated Mines, 42 years ago, and the first crushing-machine west of Truro, at the same mine, Mr. Taylor said the jigging-machine was constructed on the model of one designed by a Cornishman, at the Duke of Devonshire's mine, at Grassington, and both that and his father's crushing machine, built for the Crownedale Mine, near Tavistock, early in the present century, were invented to meet a scarcity of labour, and gave rise to fears that the bal girls must all be thrown out of employ. Mr. Taylor gave a preference to Marsden's over Blake's crusher, and his reasons for that preference (which will be found in the records of the institution, when they are published). He highly approved Mr. Husband's improved stamps. The smaller particles of tin were difficult to be seen, and as difficult to arrest, but at Restronguet, to-day, they would see tin the size of gravel, and even of pebbles. The Germans had gone far ahead in the invention of self-acting jigging-machines.

Capt. MAYNARD said their tin was dressed and twice calcined, then 50 per cent. of alkali or soda-ash was mixed with the ore; this was subjected to heat, and then the wolfram, having a greater affinity for the alkali, became attached to it. In the case of much incrustation, the stuff was re-stamped, re-dressed, &c. This was all the information he could give at present; for there were secrets connected with the details of the process which he was not at liberty to disclose. (Laughter.)

Mr. HUSBAND described, at the request of the Chairman, the work done by his stamps, and its economical, prompt, and effective action. Throughout the world a ton of iron was used in stamping 500 tons of stuff; in Cornwall a ton to 300 tons of stuff; but in the pneumatic stamps 6000 tons of stuff were stamped by 5 tons of iron. The pistons of the new stamps were steel-ringed, and not packed, the rings lasting three or four months.

Mr. T. S. BOLITHO, who had been specially appealed to to take part in the discussion, with regard to the question of the amount of tin produced, said that the actual production of 1871 was 16,000 tons of ore, producing 66 per cent. of metal. There had been a gradual increase for several years, but now the quantity, in consequence of the increased price of labour, and perhaps the diminished price of tin, was gradually decreasing. After very long experience he had come to the conclusion that, unless there was further improvement in the dressing of tin, the quantity raised in Cornwall would considerably lessen. When Sir Stamford Raffles, in 1816, came from the island of Banca, and saw the dressing operations as they were then conducted in Cornwall, he said, tapping him (Mr. Bolitho), then a boy, on the shoulder, "My little man, unless you can improve this you will see the end of the mines of Cornwall;" and they would have seen the end of mining in the county but for the improvements that had been made. First of all, he would bear testimony to what had been done by Mr. William Brunton, the introducer of the circular calciner, by which he had been the means of doing more for the mines of Cornwall than any one else, except Watt, Trevithick, and perhaps Wolff. It was true that whilst the patent existed very few used the calciner, but no sooner had the patent expired than it was introduced throughout the length and breadth of the land. Wolfram was the great enemy of the tin smelter, and they were greatly indebted to Mr. Oxland for his method of getting rid of it, which, although far from perfect, did a great amount of good. There was, however, this danger in the process, that if the proportion of soda ash used exceeded the proper proportion to the tungstate it united with tin instead of the tungsten, and formed a stannate of soda instead of a tungstate. Immense would be the benefit conferred upon the county by Mr. Husband's pneumatic stamps if they would reduce the tin to an even grain. He (Mr. Bolitho) was in a position to state that 40,000*l.* worth of tin was recovered every year that went down the Red river in the shape of slime. People said that that ought to have been saved at the mines, but there was one great difficulty in the way, which was discovered originally at Wheal Vor. The sand washing down from that mine was at first filling the harbour of Porthleven; and a dam was erected across the valley in order to stop it. In this way an enormous quantity of sand was accumulated. This was found to contain tin, and in the end about 100,000*l.* worth was taken out, which otherwise must have gone into Porthleven Harbour. Now, the reason this could not be saved at the mine was this. Minute crystals of tin adhered to somewhat larger crystals of matrix—probably quartz. This floated off in the water to a considerable distance, and could not be caught unless it was made to deposit itself in large ponds. Then in the course of years the sand, by the combined action of the water and the air, became oxidised, and the minute particle of tin became freed from the matrix with which it was associated. The consequence was that in the space of four or five years tin could be got out of a deposit of this kind that was really unattainable when the deposit was first formed. What they wanted to meet this difficulty was machinery that would make a more perfect separation of the matrix from the oxide of tin; and that would reduct the metallic particles more nearly to the same size. Some portions of ore were not brought fine enough, and some were too small, and they wanted a process which would ensure a more uniform size. Years ago Mr. Brunton introduced a separator for this purpose, which did not fully answer then, but might now be improved upon. The idea was derived from a suggestion made by Mr. Brunton that much of the copper in the common tin was a mechanical mixture, and might be got ready by centripetal action. Accordingly a quantity of melted common tin was put into an iron pipe closed at both ends, which was kept red hot and whirled rapidly round. The result was that not only was the bulk of the copper sent to the ends of the pipe, but some of it was actually forced through the iron. As an experiment it succeeded admirably, but they failed to reduce it to practice. The principle of the separator was that substances differing in specific gravity would fall through water at different speeds; but the difficulty was the great variety of size. A piece of matter having the gravity of five would fall as rapidly through the water as a piece half its size, which had the gravity of seven. Here was the real difficulty that had to be met.

The PRESIDENT having announced that the next meeting would be held at Cardiff, the company adjourned for a trip by special train and steamer to the Penryn Granite Works of Messrs. Freeman, and the Restronguet Stream Works, taking luncheon on the way at the Polytechnic Hall.

The members of the Institution resumed the reading and discussion of papers on Wednesday, Mr. BRAMWELL, vice-president, occupying the chair, as before.

The first paper read was a "Description of the Tin Stream Works in Restronguet Creek, near Truro," by Mr. C. D. Taylor, of Devoran, communicated through Mr. R. Taylor. The Restronguet Stream Works have been worked for many years, and at the end of the last century large quantities of tin were raised by the process of damming out the water at the end of the creek, and the removal of the overburden. Eventually this was stopped by a storm which filled the creeks with water. More recently other portions of the submarine deposit were worked by a shaft being sunk in the rock by the side of the valley, and tunnels thence driven into the tin ground. Operations were, however, after some time again suspended, until the Messrs. Taylor took the working up. They have sunk a shaft on the shore deeper than the previous one, and carried out their level, which communicates with an iron shaft sunk in the centre of the creek, in the rock instead of in the tin ground, which is worked therefrom. The stuff is brought to the surface in the trams in which it is first placed. The dressing is effected by washing the stuff on a grate to get rid of the stiff clay. Collom's jiggers and the knife-propeller buddles were afterwards employed where required. These various points were shown to the members of the Institution at their visit on Tuesday.

"On the Application of Portable Engines for Mining Purposes," by Mr. John Richardson, of Lincoln.—Messrs. Robey, of Lincoln, have been in the habit for the past 14 years of supplying portable engines to mines in place of fixed engines for winding and similar purposes. Diagrams of old and new engines for winding purposes were shown. Mr. Richardson stated that the portable engine did not require any expensive works of erection, that it worked at a higher speed, and with less labour. There was likewise considerable economy of fuel in consequence of the new engine having multitubular boilers and jacketed cylinders. A special source of economy of fuel in the case of the winding engines of metalliferous mines arose from the reduced loss of heat in consequence of the jacketing while the engine was standing. In consequence, too, of the artificial draught of the blast caused by the exhaust steam inferior coal could be employed in the portable engine. In some cases the fuel had been simply two-thirds of ashes from a stationary engine and one-third coal. As the blast was only in action when the engine was, its stopping caused the fire to be automatically damped down. There were two kinds of engines proposed—one self-propelling, specially adapted for sinking trial shafts; the other for ordinary purposes, semi-portable. The engines were calculated to raise loads of 1 to 4 tons at speeds varying from 250 to 600 ft. per minute; and as the drums were small, the wire-rope used was made with more strands. The advantages of the economy of space in the new engine were greatly marked when an engine had to be worked underground. The results of these engines as regarded economy of fuel, fixing, and cost of attendance, when compared with the engines previously used to do the work, were:—Economy of fuel, 15 to 40 per cent.; a similar saving in the cost of erection; a total saving in first cost ranging from 10 to 60 per cent., according to the cost of labour and materials in different localities; and a saving in the working labour. At Boscaswell Mine one of the 20-horse semi-portable engines had now been in work more than a year. The gross load raised at each time of winding was 3 tons, the loaded skip being two minutes travelling from the bottom of the shaft. The fuel used was two-thirds ashes. The first cost was only one-third of that which it had replaced, the saving in fuel 15 per cent., that of attendance 25 per cent. The loss of power in friction was 15 to 17 per cent., as against 50 per cent. in the previous engine, which, however, was of an inferior character. The fact of the drums employed being of small diameter did not tell so much against the portable engines as might be imagined.

The discussion upon this paper was at once the most interesting and the most important of the whole meeting. The Cornish engineers present, including Mr. Husband, Mr. F. Michell, and Mr. Hocking, with Capt. Lean and others, denied that the Cornish engines were of necessity inferior to the semi-portable engines suggested, either in performance or economy of work; and the general feeling of the meeting was clearly that expressed by the President, that while the semi-portable engines had their use in opening new mines and the like, yet for continuous working permanent engines were better adapted.

"Description of a Machine for Shaping the Models used in Experiments on the Forms of Ships," by Mr. William Froude, F.R.S., of Torquay. This was a full and minute description of the mechanism which Mr. Froude has employed in forming the models for the very important experiments on the form of ships that he has been conducting. Mr. Froude has adopted solid paraffin as a material instead of wood, and has found it answer admirably. One of the models was produced, and excited great interest.

"Description of the Mechanical Scraper for Removing Incrustrations in the Mains of the Torquay Waterworks," by Mr. Little, of Torquay, communicated through Mr. H. T. Ferguson. Examples of the scraper were shown in illustration of the paper—as first suggested by Mr. Appold, as next designed by Mr. Froude and Mr. Box, and as now in use on Mr. Froude's arrangements. Much of the success which had attended the use of the scraper was due to Mr. Weeks, the water-bailiff. The scraping of the 14½ miles of pipe was now conducted annually. When first scraped the delivery was 317 gallons per minute; and the scrapings increased it to 450. The successive annual scrapings had been productive of a steadily increased delivery, so that now after scraping, the yield was brought up to 681 gallons, gradually falling from that quantity to 499. The operation now cost only 10*l.* or 12*l.*, but in the first two years 1200*l.* was spent in making arrangements. Had not the scraping answered 30,000*l.* must have been spent in laying a new main.

Two other papers were on the programme, but there was no time left to read them. There were "Descriptions of the Bracket Chains for Suspending Double-headed Rails on the West Cornwall Railway," by Mr. James D. Sheriff, of Truro, communicated through Mr. William Wright; and "On Hydraulic Machinery for steering, reversing, and discharging cargo, &c., in steam-ships," by Mr. Andrew Betts Brown, of Edinburgh.

Votes of thanks were then passed by acclamation to the Royal Cornwall Polytechnic Society; the honorary local secretaries, Mr. J. H. Collins, F.G.S., and Mr. Ferguson; the proprietors of the different mines and works visited and to be visited; and to the railway companies for the facilities afforded.

An adjournment was made to the smelting works of Messrs. Bolitho, at Chyandour, where the members and their friends, to the number of upwards of 100, had a most hospitable reception. The various processes of smelting were explained, furnaces tapped and blocks made, after which the company sat down to an excellent luncheon, the chief features of which were beef steaks cooked most deliciously upon the hot tin. Full justice was done to the welcome repast, and to its excellent concomitants.

Mr. T. S. BOLITHO briefly thanked the Institution for the honour done to the firm by their visit, and expressed his assured conviction that great good to Cornish mining would result from their meeting in that county. He was sure it would lead to economy in coal and power, to improvements in ventilation, and to the adoption of better modes of dressing.

Mr. BRAMWELL heartily and humourously returned thanks on behalf of the Institution. As mechanical engineers they were doubly delighted with the luncheon, not only because it was such an excellent preparative for what was to follow, but because it was such a happy illustration of the utilisation of waste heat. If Messrs. Bolitho had not thought of cooking the steaks, the heat which the blocks gave out as they were cooling would have been lost. Anything in the way of economy of fuel interested mechanical engineers at any time, but this mode of treating the question was exceedingly ingenious, and, he might add, instructive.

These remarks were, it is needless to say, received with laughter, from their assumed practical character; and the party then dispersed, some going off to Botallack and some to the Land's End. The members will visit Messrs. Harvey's, Hayle, Dolcoath, and Carn Brea, and be entertained at the latter mine by Capt. Teague.

Meetings of Public Companies.

AUSTRALIAN MINING COMPANY.

The twenty-eighth annual meeting of shareholders was held at the London Tavern, on Monday,

Lieut.-Col. GEORGE PALMER in the chair.

Mr. HARRIS (the secretary) read the notice convening the meeting, and the report of the directors was considered as read.

The CHAIRMAN, having expressed the very great pleasure he experienced in meeting the shareholders again on this occasion, moved "That the twenty-eighth annual report of the directors, together with the cash account and balance-sheet to June 14, 1873, now taken as read, be received and adopted." Without further comment he (the Chairman) concluded by observing that any information or explanation required by any shareholder upon any point the directors would be most happy to give it him.

Mr. H. COLLIER seconded the proposition.

An irregular and to a great extent unimportant discussion then immediately ensued, upon a SHAREHOLDER enquiring the reasons that had influenced the directors in coming to the conclusion as set forth in the report—that the proposed dissolution of the company, with a view to the formation of a new company, would be most injurious to the interests of the shareholders; on the one hand it being contended that the directors had not acted with consistence or justice in alluding to the subject in their report, inasmuch as it was not possible the question could be discussed with any legal validity on the present occasion (an extraordinary meeting, specially convened for the purpose, being the proper time to decide on such a plan); while, on the other hand, Mr. F. COLLIER intimated that the directors were quite prepared to state in detail the grounds upon which they had thought fit to insert the paragraph referred to in their report.

After some further discussion, in the course of which Mr. FRANKLIN observed that, as doubtless it was intended to treat the shareholders with becoming frankness, the enquiry should, in his opinion, be answered before proceeding further with the business of the meeting.

Mr. LEGG moved, as an amendment, that the report be received, approved, and adopted, with the addition after the last words in the report of "should the question come before them in the regular way."

Mr. Hale and other shareholders then addressed the meeting, and at the conclusion of their remarks it was asked if anyone seconded Mr. Legg's amendment, but no response being made the proposition fell to the ground.

Mr. HALE observed that the opportunity for discussing the question of the advisability or otherwise of the dissolution of the company did not present itself; he, therefore, only asked the directors not to prejudice the opinions of shareholders who had not yet heard the subject mooted by the insertion in their report of any paragraphs with reference to it. He then begged to move as an amendment that the words from "your directors have, however, given their best consideration to the subject," to the end of the paragraph, be left out. The statement would then remain a simple matter of report—that on the 1st inst. a letter of such and such an effect had been received, and that the question would be considered at an extraordinary meeting.

Mr. FRANKLIN, in seconding the amendment, said he did so for this among other reasons—that the parts of the report thus struck out were inconsistent with facts and the records of the company. He forbore for the present to impeach the statements there made, preferring to postpone the discussion until it came before the shareholders in the regular way.

Mr. F. COLLIER expressed himself quite prepared to justify the insertion of the last paragraph in their report. At the request of the meeting he then proceeded to read the letter received by the board, as follows:—"The undersigned holders of shares in the company hereby request the board to take the first opportunity—at the ensuing general meeting—of submitting for the approval of the proprietors a plan for the dissolution of the company, with a view to the formation of a new company, to be called 'The Australian Land Company (Limited).' The capital of such new company to be the sum of 140,000*l.*, divided into 20,000 shares of 7*l.* each, fully paid, or as may be determined." He then went on to say, in justification of the act taken by the board in the matter, that such a communication having been received, although they could not do what it suggested, they could not omit as men of business to state in their report that such a letter had been received. Having said thus much, was it reasonable to suppose that they, having regard to the preservation of the true interests of the shareholders, could withhold their opinion on the subject, or refrain from advising the shareholders as to what course they thought it in their judgment most advisable to pursue? And then in support of the opinion they held and had expressed in their report regarding the proposition made, the speaker next read the report of the committee appointed in July, 1868, for the express purpose of considering the question, which report stated in conclusion that "having regard to the attendant risks in which it appeared upon investigation that the company might be involved by adopting such a course (the winding up of the company) they (the committee) do not recommend the adoption thereof; but, on the contrary, they are of opinion that it is not advisable at present to make any alteration in the constitution of the company." He would now briefly call the attention of the meeting to the certain and probable mischiefs that would ensue to this company if this course were adopted. They must, however, in the first place consider whether the plan of dissolution could be carried out, inasmuch as it was obvious if it could not it must be injurious to agitate the question, and they had ascertained that it could not be accomplished, because there was not the slighest probability that the consent of the requisite number of shareholders could be obtained. Then it was to be remembered that the company had 60 tenants to deal with. If the dissolution of the company were resolved upon they would have to get them to surrender their leases, in which case the company would become liable to claims for compensation. Again, as soon as their tenants were told the company was about to be dissolved all their improvements would be stopped. And whereas at present the company's lands were being properly cultivated and money expended in their improvements, directly it became known that its affairs were to be wound-up there would be an end to all that outlay of trouble and capital. And further, when counsel's opinion had been taken some years since on the matter, the board had been informed that the carrying out of this plan involved many very serious considerations. For instance, it was doubtful whether if they gave up the Charter under which they were incorporated they might not invalidate their title to their lands. Apart, however, from all such considerations, he might assure the meeting that any attempt to carry out the scheme would prove futile.

Mr. LEGG, in urging upon the shareholders the advisability, having regard to their own interests, of supporting the policy of the board, spoke most encouragingly of the prospects of the company. The present prosperity of the South Australian colonies might, he observed, be regarded as constituting the turning point in the history and fortune of this company.

The amendment was then put to the meeting and negatived, Messrs. Hale and Franklin, the mover and seconder, being the only members who supported the proposition. The original motion was then put and carried.

The CHAIRMAN then moved, and on being seconded it was resolved, that Mr. H. Collier be re-elected a director of the company.

Mr. LEGG moved, and on being seconded it was resolved, that Col. G. Palmer be re-elected a director of the company.

The retiring auditors were next re-appointed, at a remuneration of 30 guineas.

On the motion of the CHAIRMAN, who testified to the high ability and worth of their manager, a vote of thanks was accorded to Mr. Davenport.

A similar compliment having been awarded to the Chairman and other members of the direction the meeting broke up.

GLENARIFF IRON ORE AND HARBOUR COMPANY.

The statutory meeting of shareholders was held at the offices, Walbrook, on July 25,—Mr. MCCANDLISH in the chair.

The notice convening the meeting was read.

The CHAIRMAN said this was a formal meeting, held in compliance with the Companies Act, and the only business that could be transacted was the election of auditors. The auditors named in the prospectus were Messrs. James and F. Ford, public accountants, and, perhaps, the shareholders would elect another auditor from their own body; but with regard to the official auditors he would move that Messrs. James and F. Ford be elected auditors of the company.

Mr. GEORGE BATTERS seconded the proposition.

Mr. HARRISON proposed that Mr. T. Ronaldson be appointed the shareholders' auditor. The name of that gentleman was a legion in itself.——Mr. STARNES having seconded the proposition, it was put and carried unanimously.

Mr. T. RONALDSON thanked his fellow-shareholders for this mark of their confidence, in return for which he would always endeavour to do his duty.

The CHAIRMAN said the board had added to their number Mr. Shore, whom they found to be a most important addition. It was not necessary that this appointment should be confirmed at this meeting, as at the next general meeting, to be held in 1874, one-third of the directors retired by rotation. The company was registered March 25, and of the total capital of 13,000 shares, 12,135 were allotted, leaving 865 unallotted. These were not allotted because it was thought that as the company came to be better known among the friends of the directors and shareholders, applications might be received from people whom they would very much like to see connected with the company—such, for instance, as consumers of ore, and others; but at the same time all those shares had been practically placed, because the vendors were quite ready to take them up, but still they were at the disposal of the shareholders or their friends if they chose to apply for them. Calls had been made, representing 24,500*l.*, of which some 19,595*l.* had been received, leaving about 5000*l.* still to be received on the present call. The amount expended was a little over 15,000*l.*, leaving on hand and to come in 9500*l.*, to meet the requirements falling due for materials and plant purchased, but further sums would be required to pay wages and carry on the works. He did not think, however, they would require to make another call

for about two months. The amount expended had been principally in the purchase of plant, engines, &c., for the construction of the railway and pier. Mr. Begbie and himself had just returned from a visit to the property, and he was glad to say that they came away very favourably impressed with their prospects. The harbour had been fairly commenced—the first portion was to be a series of open timber piling until somewhat deeper water was reached, when the solid pier would protect all the ships loading with ore. Close by the pier a stone quarry was being opened for the purpose of the pier, and leave had been obtained to put down a tramway to enable them to bring the stone to the pier. Some time since permission was obtained to build a bridge over the public road, the stonework of which was now complete, and the ironwork was ready to be put upon it. The railway had been carefully marked out, and all ready for the "navvies" to commence, which they would do in a few days; and preparations had been made for commencing a viaduct over the ravine about half-way up to the mine; that viaduct being the key to the completion of the railway, it was being pushed forward so as to have the railway open before the end of the year. They had been opening the mines so as to be ready to continuously return ore upon a large scale, and the progress hitherto made him confident in the the opinion that by the time they would be ready to ship there would be sufficient ground opened out to enable them to go on producing ore at a very rapid rate. The preparations made consisted in eight levels driven in on the seam of ore from the face of the hill; these levels were fortunately being driven up the hill instead of down, and consequently the water drained out of them without the slightest trouble or expense. He believed the greater portion of all their levels would be driven under the same favourable conditions. The longest level had gone in 23 fms., the total drivage in the eight levels being 81 fms., or an average of 8 fms. each. Probably before doing much in getting ore each level would be driven in about 50 fms. The seam appeared to run from 12 in. to about 20 in. in thickness, an average probably of 15 in.; the levels show the ground to be extremely favourable—just above the ore the basalt rock exists—forming a most admirable roof, requiring but very little timber, only just where the levels pass through the surface. It was in contemplation to commence a considerable number of houses for the accommodation of the workpeople, the plans for which were now being prepared. He should say before concluding that his examination satisfied him that the prospects held out in the prospectus were most likely to be fully realised—the property consisted of nearly 7000 acres, and he believed that the seam would be found under 4500 acres of it, the whole of which was situated for economical and most advantageous working. There was an enormous length of the vein opened, which involved no further expense than that of actual mining. The ore was quite as good in quality as anticipated, and it seemed to run through the greater part of the property, judging by the workings in the vicinity. If they estimate the seam of ore at an average thickness of 15 in., the quantity under 4500 acres would be about 12,000,000 tons, which would allow of their mining 400,000 tons a year for 30 years, whereas in the prospectus it was estimated the output would be 100,000 tons. Under these circumstances, no doubt could exist as to the success of the enterprise. (Hear, hear.)

Mr. George Batters said the company was much indebted to the Chairman for the great personal interest he took in its affairs. Under such able supervision there was a certainty that the works would be carried out in a proper manner. Having such a man at their head, holding such a large stake with his friends, they had all the advantage of his great experience in the completion of such works, not the least important being the conversion of what is a very imperfect loading place into a most excellent harbour—the pier was upon a scale that would enable two steamers of 1000 tons each to load at one time, and even in doubtful weather could ship ore and steam away to sea—in fact, the harbour would have a very great advantage over the very limited means which the other mines had for shipping ore. It was beyond all question that there was an immense deposit of ore, and of the right quality required by ironmasters at the present moment, the great desideratum being an iron ore which will make the Bessemer pig. At the Ebbw Vale Works last week he saw similar ore and Spanish ore being worked into the finest Bessemer pig. The ore was entirely free from phosphorus and sulphur. So that whatever may be the future of the iron trade, ore of such quality as theirs, worked so cheaply, shipped with such facilities, and so near the markets, would ever find a ready and satisfactory sale. There was no doubt the work would be most profitable, and the company a model one: they had almost a guarantee from the Chairman that a dividend would be paid next year. (Hear, hear.)

A vote of thanks to the Chairman and directors closed the proceedings.

GREAT WESTERN COLLIERY COMPANY.

The eighth ordinary general meeting of shareholders was held on Monday at the Cannon-street Hotel,

Mr. J. C. Day, Q.C., in the chair.

Mr. G. W. Wood (the secretary) read the notice convening the meeting.

The Chairman moved the adoption of the report and accounts, and said he thought the shareholders would consider it a very gratifying one, and was caused mainly by the great rise which had taken place in the price of coals; and had it not been for the present high price of labour, and the difficulty of obtaining it, the dividend would have been very much larger, for he was happy to say there was a very much larger quantity of coal in the colliery than they were able to get out. But the labour question was a very difficult one, and had given Mr. Briscoe (the manager) a great deal of trouble; however, he had managed this difficult matter extremely well, and in this important particular of labour this colliery was much better off than its neighbours. There were one or two points in the report to which he would call attention. There was one sentence which had probably caused the shareholders some little dissatisfaction, and that was where it was stated that "after protracted and tedious negociations agreements for leases have been signed by the lessors." The fact was that the difficulties in the way of getting the agreements signed were very great. He did not know who were to blame—certainly not the directors, manager, or secretary; at any rate, a long delay did take place, and that delay was very much to be regretted at a time when the price of coal was high. This had hindered them in the steam coal operations, but the directors were doing all in their power to make up for lost time. The manager had received instructions before the agreements were signed to prepare plans for carrying out the sinking, and immediately the agreement was signed the work of sinking was commenced. The engine was now up, and the sinking had been pushed on from No. 3 to the Havod vein of coal. He was assured by Mr. Miller, who was intimately acquainted with the district, that the Havod vein, although not thick, was of great value, and would probably produce 2s. per ton more money than the other coal. In addition to that, immediately above the Havod vein there was a thickness of fire-clay, which was included in the company's lease. As regarded the steam coal, the manager was using every exertion to get down to it; he did not speak of going down to "try" for it, for he assumed the existence of the steam coal; and he was happy to say that in the adjoining colliery (where a trial shaft was sunk) they had proved that the estimate made in respect to the steam coal was extremely accurate, the only difference being that they reached the seam at a depth of 80 yards less than was expected. On this company's property they had already cut through what was called the "rider" to the steam vein, and it was expected that in two or three months the seam of steam coal itself would be reached. Of course, with coal at the present price, time was of the utmost importance, and every effort was being made to reach the steam coal as soon as possible. It was very gratifying to find that the anticipations relative to this seam had been so far verified. He was going to move that a slight alteration should be made in the report by the omission of the following words in one of the paragraphs:—

"The directors now recommend that 1/ per share be added to each of the 6000 shares in the company (making them 18/. paid), to represent the proportion of the profits of the year applied to capital purposes." He would explain what it meant. In the course of last year they had paid off a claim of the Great Western Railway Company, on account of the purchase of the property, amounting to 7800*l*. Although that had been paid out of the revenue, it was perfectly clear to his mind that it was a payment on capital account, as it was the last instalment due on the Great Western Railway Company for the purchase of the property. It was not paid to the Great Western Railway Company in cash, but they took it out in coals at an agreed price, and it was, therefore, lent by revenue to capital account. The difficulty was to know how to deal with the account, and after careful consideration the directors agreed to recommend that 1/. per share should be added to each of the 6000 shares in the company, making them 18/. paid; but Mr. Surtees (a shareholder) called upon the directors, and explained that it would be an unfair dealing with respect to the old shareholders, as it would be picking the pockets of the old shareholders for the benefit of the new. The directors upon looking into the matter saw that such would be the case, and they cast about to find how best it could be dealt with; several modes were suggested, but which the directors felt would fairly meet the case, and under these circumstances he suggested that, for the present, the amount should be carried to a suspense account until some means were found of dealing with it which would be fair to all parties. He should, therefore, propose that the sentence which he had quoted above be left out of the report. He ought to point out that the profits, and, of course, the dividend would have been larger had it not been that the company was hindered with some old contracts, which were carried on not, perhaps, at a loss, but still at a price which did not leave a fair margin of profit. If it had not been for that the present large dividend would have been still larger. The expenses for wages and stores had very much increased: the royalties were also larger, in consequence of getting outlying coal, in respect to which a higher royalty was paid than on the coal taken from the original lodes; the salaries and commission had also increased. They had used means to reduce the expenses in every direction, but in the face of the great rise in labour and other things it was impossible to keep them down so low as some shareholders might desire, but the directors would be happy to receive suggestions, and act upon them wherever practicable. There was coal in abundance, and the only difficulty was getting it out. As regarded the price of coal in future, it was not for him to give an opinion, but the general feeling seemed to be that no one would see coal at the low price it was a year or two ago; and he would venture to say, also, that they would never see coals at a price which would not leave a fair profit to this company. He moved the adoption of the report and accounts.

Major W. F. Gordon seconded the resolution.

Col. J. B. Bathurst drew attention to the amount of remuneration which the directors were authorised to take under one of the clauses of the Articles in the shape of a percentage upon the net profits; and said that, looking at the large profits which the company was now making, he thought that the amount which the directors would thus be able to claim was excessive, and he thought that some alteration should be made in the clause.

The Chairman said that the present was not the meeting at which any alterations in the Articles could be discussed, but if Col. Bathurst wished to have the clause altered a special meeting could be convened, and the opinion of the shareholders taken. He could assure Col. Bathurst that the directors would afford every facility for the calling of such special meeting.

Mr. Surtees was of opinion that great credit was due to the board for the present flourishing condition of the company. Referring to the amount paid to the Great Western Railway Company, he suggested it might be dealt with by a plan which would involve a call upon the old shareholders.

The Chairman pointed out that this plan would also be open to objection, as it would not be equally fair to the old and new shareholders.

Mr. Surtees thought that under these circumstances the wisest plan would be to adopt the course proposed by the Chairman, and allow the matter to stand over for the present. He expressed his hope that the present board, who had done so well for the company, would be unanimously re-elected, and that no alteration would be made made in the constitution of the board.

The Rev. Mr. Tilly (one of the candidates for a seat at the board) said that both himself and Mr. John Cory, of Cardiff (another candidate for a seat at the board), agreed in thinking with Col. Bathurst that the clause relating to the directors' remuneration was highly objectionable, and hoped that some alteration would be made. He referred to the manager's report, and he asked for some explanation with reference to the 100 new wagons which were stated to have been built.

The Chairman said they were not wagons, but trams, which were used in the underground workings.

The Rev. Mr. Tilly asked whether any alterations had been made in the agreement relative to the steam coal?—The Chairman said that two or three slight alterations were made, but no substantial alterations. There was no alteration in the royalty.

Mr. Bryant agreed with the suggestion of the Chairman that it would be better to allow any decision relative to the 7800*l.* to stand over for the present, more especially as it would not damage the company in any way. With respect to the clause relative to the directors' remuneration, he thought it might be left to the directors to take into consideration; he had no doubt that something would emanate from the board which would be satisfactory to the shareholders.

Mr. Beaumont also agreed it was better to fall in with the views of the Chairman with regard to the mode of dealing with the amount paid to the Great Western Railway Company. He bore testimony to the great exertions which had been made by many individual members of the board, and he considered the results of those exertions had been wonderful considering the circumstances under which they commenced their labours. He, therefore, hoped that the report as amended would be unanimously adopted; it was a good one, and they ought to be thankful for it, and he trusted next year they would have a better.

The Chairman briefly referred to some of the above remarks, and incidentally expressed his hope that it had been possible to make all the shares fully paid-up, and divide them into 10/. shares.

The motion for the adoption of the report and accounts was then put and carried.

On the motion of the Chairman, seconded by Mr. Charles Burge, a resolution was passed declaring the payment of a dividend at the rate of 6*l* per cent. per annum for the quarter ending June 30 last.

The retiring directors—Mr. J. C. Day, Q.C., and Mr. Charles Burge—were re elected.

The next question was the election or otherwise of the three gentlemen who offered themselves as candidates for seats at the board.

The Chairman said that two of the gentlemen, the Rev. Mr. Tilly and Mr. John Cory, were not eligible, the former because he did not hold the necessary qualification, and the latter because there was a clause in the Articles which forbade any person being appointed a director who had contracts with the company. The third gentleman, Col. Bathurst, was eligible.

After some discussion a resolution was put to the meeting for the election of Col. Bathurst, but was rejected.

A Shareholder also proposed the election of Mr. Cory, and the Chairman put the resolution to the meeting, which was, however, rejected.

The auditors were re-elected, and a cordial vote of thanks to the Chairman and manager closed the proceedings.

DENBIGHSHIRE CONSOLIDATED MINES.

An ordinary general meeting of shareholders was held at the offices of the company, Great St. Helen's, on Wednesday,

Mr. Francis Rudall, jun., in the chair.

The Secretary (Mr. E. J. Bartlett) read the notice convening the meeting, also the minutes adopted at the last ordinary meeting. The balance-sheet, made up to June 30, showed a cash balance in hand and due of 2962*l.* 16s. 11d., without a single liability, and not crediting lead in hand or reserve, or valuing the extensive property account.

The Chairman, in proposing the usual resolutions, said the statement exhibited was so clear that it was hardly necessary to offer remarks, but he would be most happy to answer any questions the shareholders present might deem proper to put.

The resolutions for passing the balance-sheet were unanimously carried.

The Secretary then read the reports of the directors and agents, as follows:—

Your directors have pleasure in presenting the half-yearly balance-sheet, made up to June 30 last, which exhibits a credit balance of 2962*l.* 16s. 11d., without the existence of a liability, or valuing the extensive plant, &c., included under "property account." During the present month three of your directors have visited the works, and return perfectly satisfied with the prospects of this important mining property.

July 28.—We beg to hand you our report of work carried on during the past six months.—Surface Operations: Washing-floors levelling for foundation, one new kiln built to receive lead stuff, grating and picking table completed, two new buddles, two slime pits, reservoirs for water, two jigging machines, launders to carry water to pool, and all other necessary arrangements for treating the produce. Frame work for new crushers, and attaching some to winding-engine, connecting small rollers to treat the stuff finely when required, new boiler fixing, erection of pulley-stands from drum of winding-engine to Quaker's shaft with angle-frames, fixing winding-frame at Parry's shaft, and sundry work too numerous to particularise.—Mine: Phœnix Engine-Shaft: We have not done much during the past six months at this, with the exception of fixing a cistern below the 112 for sinking lifts, but shall have the whole of the pitwork ready to start sinking by the end of another week. At the present bottom of pit we are informed of the existence of a run of lead ore. The 110 yards level east has been extended 37 yards, through very hard ground, but of promising nature. In two places we intersected small strings of lead ore, leading us to believe that the run from above had made down to the level: but after a close examination, having communicated and unwatered the old workings, we found that the ore alluded to could not possibly be so soon met with in the driving; and we estimate even now that we are 5 fms. off this important intersection. In the forebreast the matrix of the lode is exactly the same character as that to be seen in the rise and incline, and, altogether, we like its appearance much. The vein is fully 5 ft. wide, well defined, bearing in the direction of all the most productive lodes in the district, and we feel more sanguine than hitherto that at the junction of the Coed y-Fedw and other lodes a result will be achieved satisfactory to all.—The Rise and Incline: After considerable difficulty we managed to get through from the 112 to the 76; the task was not accomplished without much trouble, and not being able to ascertain how far the old workers had gone, no reliable calculation could be made in the 112. The ore ground unworked, however, we found better than anticipated, yielding fairly with our limited means of exploration. In the roof we cut into old workings, which reduced its value, but for nearly 25 yards long, we are pleased to say, lead ore is standing, and holds out every inducement for us to rely upon its improvement, and still we have not yet seen one-third part of the ground in connection with this run; but when the 112 is communicated a good trial can be given, and, in our opinion, the results will be in the highest degree satisfactory. The bottom sump driving east is producing some very good paying stuff, and we think that not only shall we continue to raise from this point but reasonably calculate on its improving: the lode at present is widening and the ore ground increasing.—Quaker's Shaft: The 112 we have extended 50 yards during the past six months—for the first 20 yards the ground was hard and difficult to drive, but a great change took place, and for the rest of distance (30 yards) we have been in ground of highly mineralised character and such as all practical miners would expect to find large quantities of lead ore. Specimens were taken out nearly the whole distance, and our opinion is that we are approaching a splendid course of lead ore; the general appearance of this end would lead us to expect that the junction of veins has resulted, but we cannot yet speak positively. One thing is quite certain, similar ground has seldom failed to produce hundreds of tons of ore; a short crosscut will be extended, as we may be even now driving by the side of a deposit. The 66 west has been driven 61 yards, and, as the weekly reports will testify, a more promising lode it is impossible to see, and in the course of a few weeks this end will be under Barn shaft, where good ore is reported as left. The ground and lumps of ore met with are, to an extent, a guarantee that our expectations will be realised.—Parry Shaft: We did not start here until the early part of May last, and were successful in getting out the water without the aid of machinery. After clearing the shaft to a depth of 42 yards, we found a level extended east 40 yards filled with water; when tapped we cleared the stuff, and found some splendid solid lumps of ore fallen from the back. We are now engaged in sinking a sump from the 40 near the extreme end of the level, and are now down 6 yards below the level, and in every foot we sink through we find occasional lumps of ore, as if it is the pride of the lode throwing out small shoots of ore from the main body below. It is our unanimous opinion that below our present depth there is ore in abundance. To the west of this sump we are driving a cross-cut south, and have extended about 15 yards; our object in driving this cross-cut is, in the first place, to properly prove the width of the lode, and, so far, we see no signs of a foot-wall, and, strange to remark, we have found lumps of ore in the whole distance driven, thus proving us to be still in the lode, and, no doubt, when the side of the lode is met with the result will be equal to our expectations; at present no one can say what is the worth of it. The matrix is such as would lead any practical miner to suppose that we shall find ore in quantities beyond description. During the past six months we have opened and explored 349 yards of ground, as follows:—In the 66 west 61 yards; in the 112 west 50 yards; in the 112 east 37 yards; in the rise and incline 115 yards—115 yard in ore ground; in the bottom sump, 12 yards—12 yards in ore ground; in Parry's shaft, 74—27 yards in ore ground: total of opened and explored ground, 349 yards: total in ore ground, 154 yards. In this total we have seen ore every yard driven. In conclusion, the most important points we are looking forward to are the junction of the veins at the 112 east, the intersection of ore ground in this level, and the communication with Barn shaft at the 66 west. The whole of these points will be arrived at within three months from date, when we are thoroughly satisfied from the present appearances that our most sanguine hopes of a permanent and successful mine will be realised.—Dressing floors: The washers are making fair progress with the dressing of ore with the view of preparing another parcel for sale. All are in thorough working order, and hope that we shall be able to send to market monthly parcels.—J. Pryor, John Edwards.

Mr. Bartlett said it was expected at the last general meeting that the run of ore at the incline would before this have been intersected in the 112, but after completing the rise to the 76 it was then clearly ascertained that the level must be extended some further distance (say, 5 fms.), when great results may be expected. He further stated that the great extent and value of the property would be best appreciated by a visit, and that undoubtedly early and lasting dividends would result from the vigorous development now being carried on.

Several shareholders spoke as to the satisfactory manner in which the whole of the affairs had been conducted, and desired to express their pleasure at the progress made. A hearty vote of thanks to the executive terminated the proceedings.

GORSEDD AND CELYN LEVEL CONSOLIDATED LEAD MINING COMPANY.

The half-yearly meeting of shareholders was held at the offices of the company, on Wednesday,

Mr. Francis Rudall, jun., in the chair.

The notice convening the meeting was read, with the minutes of the last, which were confirmed.

Mr. E. J. Bartlett (the secretary) read the balance-sheet, which was made up to the latest date, and exhibited a credit of 4724*l.* 5s. 10d. after the placing of unissued capital, and without including property account. The report of the agent was read as follows:—

July 28.—I beg to inform you that since the last general meeting of the company the operations of the mine have been limited chiefly to the driving of the deep level north, which, owing to the enormous pressure of water, has been a most tedious operation. The formation through which we have so far gone, or rather the last 60 yards of the driving, has been through wild, broken, heavy kind of ground, very treacherous to deal with, at times cutting into immense bodies of water, which force into the level large quantities of clay, sand, and stones, forcing the men back many yards, and even disarranging the timber supports, which in many yards had to be re-fixed, so that the progress with the level has only been 21½ yards during the six months. We have been repeatedly disappointed as to the cutting of the Gorsedd vein, being more than once under the impression that we had intersected it. I, however, beg to say that I have been down the mine to-day, and from what appears in the forebreast I am almost certain that we have now reached the western portion of the Gorsedd vein; however, in three or four days this will be proved. The heading side appears to be broken, and there is a layer of about 6 in. thick of grey shale, and more ore in it than I have hitherto seen, still the water flows from the eastern side. I should also say that we have driven north on the same vein as the deep adit has been driven in, at 58 yards deep, from the engine pit since the last meeting 11½ yards, when it was discontinued, and the men were set to drive west some 7 yards back, where, after driving 4 yards, they cut a promising north and south vein of a softish nature, with some nice lumps of ore in it; after driving 3 yards further they cut another parallel vein about 1½ yard, composed of spar, with a little ore interfixed. I consider both these worth further trial. We have also driven east on the Gorsedd vein at East Mine 15 yards, where the lode appears both powerful and promising. I have now 12 men the sinking of Coetia Gelynen pit, 20 yards, at 8*l.* per yard.—John Jones.

The Chairman, in moving the reception of the balance-sheet, said that having so recently met the shareholders he could not add much to the information then afforded, but the latest news was certainly very encouraging. The Gorsedd vein had, no doubt, been cut, and a few days would make a great difference to the mine regarding its value. Although disappointment had been met with still it was satisfactory to note that the troubles, if he might call them so, were over, and he congratulated the proprietors upon the present favourable position. The sinking of the Coetia Gelynen pit had been started, and the men were making good progress. The shareholders must recollect that this point would render workable a body of ore that certainly did exist. In conclusion, he would simply ask a little more patience, which would, no doubt, be crowned with success. (Hear, hear.)

Votes of thanks to the board terminated the proceedings.

BELSTONE MINING COMPANY.

The half-yearly meeting of shareholders was held at the offices, Royal Exchange-buildings, on Monday,

Mr. James Wilson in the chair.

Mr. F. R. Reeves (secretary) read the notice convening the meeting.

The report of the directors stated that the work of fixing the 10 fms. lift of the pumps in the A shaft, the extension of the skip road and footways, &c., to the 70, mentioned in the previous report of the directors, has been completed, and the sinking resumed; the depth of the shaft is now 65 fms. 1 ft. The sinking has been greatly retarded by an unusually dry spring, in consequence of which the water wheel has frequently only been going at the rate of about 3½ revolutions per minute instead of 4, the minimum speed required to work the pumps efficiently. The directors, however, believe that when certain repairs to the buckets of the pump-wheel have been effected, so that no leakages can take place, the additional revolution per minute required will be attained even in the dryest weather. The state of the copper market being very unfavourable, the directors have thought it advisable not to send the ore for sale lately, but to wait for better prices, and consequently there are now about 40 tons stored on the floors; 53 tons 3 cwts. were sold in the earlier part of the year, so that the average yield of ore of the present half-year has been maintained. In consequence, also, of the present low value of copper, the directors have dismissed some of the miners from the least productive workings at the incline shaft, although it is fully believed their exploration would have been attended with important discoveries, but the directors prefer under the circumstances to husband the resources at their command for the purpose of sinking the shaft and cutting into the great and lasting deposits of ore which are believed to exist at the deeper levels.

The report of Capt. James Neill stated that during the past six months they had only made two sales of copper ore—in all, 53 tons 3 cwts. Not sampling at the usual two-monthly sampling, in consequence of the depressed state of the copper market, they had then dressed and ready for sale about 30 tons of good quality copper ore. The returns have been less than expected, mainly owing to the falling off in the yield of ore from the stopes at the 40; these sudden changes are characteristic of this large lode, but he fully believes that as depth is attained on it the ore will be more concentrated and continuous. He sincerely trusts that no unnecessary hindrances will occur to impede the progress of sinking the A shaft; nothing has been left undone that will in any way tend to prevent them, as the intersection of the main and other lodes at the 70 is a very important and will be an interesting point. The men had been taken from the unproductive parts of the mine, and placed in those points that were productive. As the price of copper continued very low, it had been decided to store their returns until better prices ruled. They hoped by the next meeting to be able to give a report that better results had been realised. The mine continued as good as ever, notwithstanding there had been some delay in sinking, attributable chiefly to atmospheric causes, and not to any breakdown of the machinery. They would soon have the main shaft deep enough for the cross-cut into the lodes at the 70, and the directors looked forward with confidence to the time when this would be done, fully believing in the opinion of Capt. James Richards, and others, that when depth is attained, and the mine properly opened out, it will prove one of the richest in the county of Devon. He moved that the report be received and adopted.—Mr. R. W. Galbraith seconded the proposition, which was put and carried without discussion.

A vote of thanks to the Chairman and directors closed the proceedings.

COURT GRANGE SILVER-LEAD MINES COMPANY.

A general meeting of shareholders was held at the offices, Cornhill, on Monday,—Mr. Viner Clarke in the chair.

Mr. W. B. Cobb (the secretary) read the notice convening the meeting.

The Chairman said this meeting was held in pursuance of the provisions of the Companies Act, and was purely formal in its character. Upon these occasions it was not usual to report much, for the simple reason that there had been but little time to do much between the incorporation of the company and the holding of the statutory meeting. However, they had done something in this case, for they had got their machinery fairly on the road, and he thought in the course of another four months they would have some result to show for the labour and the money they were expending. At present, however, all they had done was not exactly to make a contract and organise such arrangements at the mine, but also, acting under the advice of some practical authorities, among whom was Capt. Arthur Waters, they got what they were inclined to think was the most suitable kind of machinery required for their purpose. Mr. Rogers, his colleague on the board, and himself (the Chairman) had visited the mine once or twice, and had come away more and more impressed with it, and believed it would yield a fair result for their investment. The only thing the shareholders had to do to-day was to elect directors, the present board retiring from office. He might mention that they had sent out a report, which appeared in the *Mining Journal* of Saturday (which was read).

The Chairman, in reply to questions from various shareholders, said they were not yet in a position to dress ore for market, nor did he expect they would be for the next 10 or 12 months. They knew the Mynyddgorddu lode passed through the sett, and as soon as it should be intersected the value of the mine would be very greatly enhanced. That mine had lately been sold for 70,000*l.* They had a good pile of ore at surface, which was very rich for silver.

Mr. Rogers (a director) said it was not proposed to make a sale until dressing machinery was erected, and the ore properly dressed.

The Chairman said they were already in a productive lode, but, of course, they expected it would get richer in depth. The deepest shaft is on the Pen y Cefn lode, but is at present full of water, and until the new water-wheel was working, which would be the case in about four months, the mine could not be drained. He had seen an account of the sales, and had attained other information, and it appeared that mine had always given a profit, and it had never been worked at a loss. Captain Arthur Waters says it had not only always given a profit, but was always considered one of the first in that district.

Mr. Rogers said, in order to comply with the provisions of the lease, a certain number of men had to be employed in the eastern part of the mine, where the Pen y Cefn cropped out. After driving for a few fathoms, the lode was cut and for 20 fms. long it had been productive. It was an entirely new feature in the enterprise.

...that discovery alone was sufficient to fully warrant the development of the mine. ...Arthur Waters says:—

"The set is very extensive, and so far as I could judge looks like a mineral property. I remember the mine in full swing in the years 1854 and 1855, and it was considered that the chances of success were fair indeed, especially if worked vigorously. The owners of the mine in those days were always in difficulties with reference to money matters, consequently operations were carried on slowly, sustained for a month or two together, and then resumed again, but nothing like regular and vigorous mining was carried on during my residence in the neighbourhood. The sales of silver-lead ore, if I remember rightly, were 20 to 30 tons per month, most of which were raised from the 40. The mine is sunk, I am told, to the 50, the 15, 30, 40, and 50 being driving east of shaft distances vary from 50 to 100 fms. I believe, also, that a strong orey lode will be found in the bottom of the mine as well as beyond the ends of the levels eastward. People talk of shallow mines, and that such is the rule in Cardiganshire. I cannot adopt the theory, believing that if worked in depth it would be shown that mines in that country, as elsewhere, though subject to poor floors, twitches, and the like, will recover and make runs of ore underneath."

The CHAIRMAN, in reply to a question, said that there were more shares applied for than the number to be allotted for the working capital of 8000*l*.

Mr. DAVIES said it would take six months before anything of importance could be shown, but by that time the machinery would be ready, and there would be a great deal of ore waiting to be dressed.

The CHAIRMAN said there was now about 20 to 30 tons of ore at surface, which when dressed would be worth 27*l*. per ton.

Mr. DAVIES added that a Glasgow party made 2000*l*. out of working the refuse.

The retiring directors were re-elected.

Upon the proposition of Mr. DUNLOP, seconded by Mr. GRAY, a vote of thanks was passed to the Chairman and directors.

The CHAIRMAN, having acknowledged the vote, stated that the directors did not take any fees, but as their interest was identical with that of the shareholders they would do all in their power to promote the welfare of the company. (Hear, hear.)

The proceedings then closed.

FRANCO CONSOLS TIN AND COPPER COMPANY.

An extraordinary general meeting of shareholders was held at the offices, Cornhill, on Thursday,—Mr. W. S. SUTTON in the chair.

Mr. COBB (the secretary) read the notice convening the meeting.

The CHAIRMAN said the object of the present meeting was to obtain the opinion of the shareholders as to the issuing of the 3000 unallotted shares. Under ordinary circumstances the annual meeting would be held in about six weeks from the present time. The reason more money was required was owing to difficulties having arisen which could not have been foreseen nor averted. For instance there was a long continuance of wet weather, which had materially affected their progress. They had raised some very excellent ore, which had commanded a good price—11*l*. per ton; but at the time they began to dress they were unfortunately overpowered by the water, and instead of earning money as they were doing, the funds became exhausted by continued payments for labour without any return in the shape of ore. The directors have considered fully into the present position of the company, and as far as the directors have noticed they consider it absolutely necessary that further capital should be raised. Of the 10,000 shares 7000 had been issued, and the question now was whether 1500 or more of those unissued should be offered *pro rata* to the existing shareholders. If it were decided to issue more than was absolutely required it would proportionately relieve the calls. Mr. Newton, the manager, had told them that he would not reasonably expect to meet the costs by returns for some months to come, although the returns in the meantime would go a long way towards it.

Mr. NEWTON said if they chose to stop the works in the eastern part of the mine, the western would take care of it of itself at once.

The CHAIRMAN said that would not be good policy nor good mining. Altogether there had been expended about 2500*l*. from the commencement, a great portion of which had gone for machinery, for which they had, of course, had to pay the intrinsic value. They now looked forward with hope to the future, they appeared to want about 1000*l*. He saw some large shareholders present, and it was for them to express their views upon the question.

Mr. NEWTON said that the whole of 1000*l*. would not be required for the next few months, even supposing no important discovery were made in the meantime. Franco Consols would take care of itself in a few months. He did not think more than 700*l*. should be raised at once, and he was quite prepared with one-fifth of it. After some discussion it was agreed that 2000 of the unallotted shares should be issued and offered *pro rata* to the present shareholders.

A vote of thanks to the Chairman and directors closed the proceedings.

PRINCE PATRICK LEAD MINING COMPANY.

The half-yearly general meeting of shareholders was held at the offices of the company, Seel-street, Liverpool, on July 23,

Mr. THOMAS FIELDEN CAMPBELL in the chair.

The notice convening the meeting was read, and the minutes of the last having been confirmed, the CHAIRMAN then read the directors' report, as follows:—

The directors, in presenting their report to the shareholders at this, the first half-yearly general meeting, desire to express the great pleasure which they feel in making of the present successful developments of the mine, as they bear out all that was promised in the first report which was handed to them in December last. The directors are happy in being able to report that the mine has improved in all the workings opened up; and, although Hughes' shaft has not yet been completed so as to intersect the rich lode discovered in the 100 south, and also to ventilate the mine, they are glad to say that from the sales of ore obtained from one end only they have been enabled to pay a dividend at the rate of 20 per cent. per annum. The directors feel confident that the present sales of ore—25 tons per month—will, when Hughes' shaft is down to the lode, be increased to at least 100 tons per month, as nothing is wanting but ventilation to enable them to place 15 or 20 men to raise ore from two ends, now worth 10 tons per fathom, and which they consider will be equal to a dividend at the rate of 100 per cent. per annum. One of these lodes is thus described by Capt. Kemp:—"I have been mining in Wales for upwards of 30 years, and have seen, I think, all the great mines of Wales, but I never saw anything equal to the Prince Patrick; the sight each time I visited your mine was really splendid." The men are now pushing down the new shaft with all speed, and the directors are in hopes that it will be completed in three months from this date. It will be seen from the captain's report that the men are driving south on the 50, the 15, 30, 40, and 50 being driving east of shaft distances vary from 50 to 100 fms. I believe, also, that a strong orey lode will be found in the bottom of the mine as well as beyond the ends of the levels eastward. People talk of shallow mines, and that such is the rule in Cardiganshire. I cannot adopt the theory, believing that if worked in depth it would be shown that mines in that country, as elsewhere, though subject to poor floors, twitches, and the like, will recover and make runs of ore underneath."

The CHAIRMAN, in reply to a question, said that there were more shares applied for than the number to be allotted for the working capital of 8000*l*.

Mr. DAVIES said it would take six months before anything of importance could be shown, but by that time the machinery would be ready, and there would be a great deal of ore waiting to be dressed.

The CHAIRMAN said there was now about 20 to 30 tons of ore at surface, which when dressed would be worth 27*l*. per ton.

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The retiring directors were re-elected.

Upon the proposition of Mr. DUNLOP, seconded by Mr. GRAY, a vote of thanks was passed to the Chairman and directors.

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The proceedings then closed.

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A vote of thanks to the Chairman and directors closed the proceedings.

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Mr. THOMAS FIELDEN CAMPBELL in the chair.

The notice convening the meeting was read, and the minutes of the last having been confirmed, the CHAIRMAN then read the directors' report, as follows:—

The directors, in presenting their report to the shareholders at this, the first half-yearly general meeting, desire to express the great pleasure which they feel in making of the present successful developments of the mine, as they bear out all that was promised in the first report which was handed to them in December last. The directors are happy in being able to report that the mine has improved in all the workings opened up; and, although Hughes' shaft has not yet been completed so as to intersect the rich lode discovered in the 100 south, and also to ventilate the mine, they are glad to say that from the sales of ore obtained from one end only they have been enabled to pay a dividend at the rate of 20 per cent. per annum. The directors feel confident that the present sales of ore—25 tons per month—will, when Hughes' shaft is down to the lode, be increased to at least 100 tons per month, as nothing is wanting but ventilation to enable them to place 15 or 20 men to raise ore from two ends, now worth 10 tons per fathom, and which they consider will be equal to a dividend at the rate of 100 per cent. per annum. One of these lodes is thus described by Capt. Kemp:—"I have been mining in Wales for upwards of 30 years, and have seen, I think, all the great mines of Wales, but I never saw anything equal to the Prince Patrick; the sight each time I visited your mine was really splendid." The men are now pushing down the new shaft with all speed, and the directors are in hopes that it will be completed in three months from this date. It will be seen from the captain's report that the men are driving south on the 50, and are also sinking a winze from the 100 to lode to the 120, so as to thereby open up fresh ore ground, as well as thoroughly ventilate this portion of the mine. The directors trust that the shareholders are perfectly satisfied with the balance-sheet that has been placed in their hands. They will perceive by it that there is against the mine has been charged up, even to the month's cost on the very item of this month. The object of the directors is to avoid all fictitious statements; and although they might have made the statement look better by placing the July cost, although they might have made the statement look better by placing the July cost, as against increased sales of ore this next six months, they are of opinion that it is best to let further improvements bear their own profits; and they trust that the shareholders will be content for the present with a 20 per cent. dividend. The directors have pleasure in repeating a statement which they made in their last report, when they declared a dividend of 10 per cent:—"The directors are sanguine that the sales of ore will be considerably augmented, thereby affording increased dividend, but do not desire to promise too much; yet, so far as human foresight can judge, they anticipate a dividend next June considerably larger than the present one." They can now with every confidence say that their anticipations are realised, and from all appearances they feel justified in promising the shareholders a dividend of at least 30 per cent. for next December. They also beg to call the attention upon the shareholders that the good opinion they had of the mine is to a great degree confirmed, and that they have every confidence in their captain, John Lloyd. The shareholders may rely that, as heretofore, the most energetic mode of working the mine, combined with due economy, shall be observed in developing, to the greatest advantage, the valuable prize they are so fortunate in possessing. The directors also desire to pay a passing tribute to the memory of Mr. Fairclough, one of the board, who died recently. He was a shareholder and director of this company from its earliest commencement, and was a zealous and sterling supporter of the mining interest. His loss is deeply regretted by all the members of the board and shareholders who were acquainted with him. The directors retire at this meeting, but those that are eligible offer themselves for re-election.

The captain's report was then read, as follows:—

It is pleasant to have to report to you the progress and improvement in value met with in developing this mine during the last half year, which is most encouraging in every point of view:—We extended the 100 yard level south west upon Parry's lode, about 60 yards, and the vein for most part of this driving proved rich for mineral, and is worth 60*l*. per cubic fathom, or width of the level. The end having gone far from communication the air became foul, and we had to suspend driving further for awhile, and in the meantime made a rise above this level of 4 fathoms to open ore-getting stopes, from which we are now obtaining the bulk of lead ore sold monthly, and both stopes, north and south, continue equally as rich as usual, and worth on an average from 3 to 4 tons per fathom. We are thus opening up a fine course of ore, but we cannot yet estimate its length, depth, or width, the lode being many yards wider than the width of stopes, and orey all through. To open more fresh ground we have commenced sinking a winze upon this (100) level, proving also the east and west veins, and ventilating the 120 fm. level. This winze is now 4 fms. deep, and has dropped upon most encouraging indexes to a fresh course of ore; the lode carries with it two solid ribs of ore, 2 and 3 in. wide, embedded in a very congenial matrix, and is an important new feature in the value of the mine. Turning to the north of this shaft, we have driven the same (100) level about 20 fms. upon Parry's lode in fine mineral ground, composed of carbonate of lime, with fine lumps of solid lead occasionally found therein, and as we gain length from the junction it improves in value for ore, and we daily expect to discover a good course of ore leading northward. We have forked out the water from the 120, and after a few days clearing of mud, &c., accumulated by last year's floods, we shall commence driving this level east upon the re-opened Pant lode, and believe that in a few yards driving we shall meet with important results; the lode now is much improved, and orey throughout, which is a good sign that we have got through the bar that divided the two formations.—Hughes's Shaft: We have sunk this shaft to the depth of 50 yards, and have walled and made it permanent to work Parry's and other lodes to any depth. It will also ventilate the whole mine when holed through, and be a great boon for effectually developing our parallel east and west lodes, which are all entirely virgin in this set, and have been proved to be productive veins in the adjoining mines. We have built two new ore sheds, walled round and modified the dressing-floors, and also made a new changing-house for the miners; these buildings are completed, with the exception of one roof. We have already cut and have in course of dressing our usual monthly number of 25 tons of ore. The mine and machinery are in excellent repair and working order. In conclusion, I beg to inform the shareholders that the mine has greatly advanced in value during the last half year's working, and is now on the eve of further improvement as our operations are extended. There are several important points before us now, which will almost warrant fresh discoveries to be met with soon. It should also be borne in mind that only one driving is made on Parry's lode in the whole mine, and that has been pushed forward under great disadvantages for want of air, &c., and only eight men have been employed to raise all the ores we have been getting. It is thus evident that the said lode is a valuable and rich one, and when the above shaft is holed to the 100 fm. level there will be room and convenience to double our present sales of ore. It is quite an impossibility to value our reserves in this instance; but, assuming the course of ore now before us to be only 5 fms. deep for the width of the lode, and length only to the present end of the level, we can easily see that we have several hundreds of tons discovered that can be very cheaply stoped and brought to surface for sale.—JOHN LLOYD.

The CHAIRMAN said that he was sure the exceedingly satisfactory reports which had been read must have afforded the greatest satisfaction to the meeting. It was, indeed, a pleasure for him to meet the shareholders under the auspicious prospects which now surrounded the Prince Patrick Mine. He was glad to find that his confidence in this undertaking, and the support he had given to the company, were now amply rewarded by the present successful state of the mine, and he congratulated the shareholders on the fact that the directors were able to increase the dividend to 20 per cent. per annum, and leave a large balance to the credit of the company. There was another point to which he desired to call the attention of the meeting—the 10s. per share due upon 4994 shares. A number of the shareholders were anxious to be allowed to pay up this amount, and although the money was really not required, still he considered that if it were agreeable to the shareholders to pay up these shares he would have pleasure in moving a resolution to that effect. Before concluding, he wished to say that every credit was due to their managing director, Mr. T. Hughes, through whose perseverance and economy the financial position of the mine was now in so satisfactory a state. He would now move that the accounts and balance-sheet, together with the reports as presented, be received and passed.

It was proposed by the CHAIRMAN, seconded by Mr. COOMBE, and carried, that Messrs. Rule, Walker, and Barker be re-elected directors for the ensuing 12 months.—It was proposed by Mr. COTTON, seconded by Mr. RULE, and carried, that Mr. W. Morton be added to the list of directors.—It was then moved by Mr. COTTON, seconded by Mr. COOMBE, and carried, that all shareholders holding shares with a liability of 10s. thereon be allowed to pay up the amount in full, provided this amount be paid within one month from this date; and that a copy of this resolution, together with a form of application, be sent to each shareholder.

A vote of thanks to the Chairman terminated the proceedings.

BASYE MINING COMPANY.

The statutory meeting of shareholders was held at the London Tavern, Bishopsgate-street Within, on Tuesday,

Dr. SALL in the chair.

The SECRETARY read the notice convening the meeting.

The CHAIRMAN said that as a shareholder in the Pinto Company he had been paid the high honour of being requested to become a director of this company, but when he accepted that position he did not know he should have had the still higher honour of being elected the Chairman of the board. As, however, that was the case, he should do his best to fill the chair as well as he possibly could. The Basye Company was incorporated on May 29, and in order to obtain funds to carry out the works which were required in Nevada the public were invited to subscribe for debentures; but as this appeal was not responded to fully, the directors were compelled to call up the balance of the 10s. per share, so that they considered this more as a private joint-stock enterprise than a public company. The first duty of the directors was to select a properly-qualified manager, and they had been fortunate in finding a gentleman whom they considered in every way qualified both practically and theoretically in Mr. Murphy. his salary had been fixed upon a graduated scale, and almost entirely dependent upon the success of the company. Mr. Murphy sailed on June 16, and on July 21 the directors received from him the following telegram:—

"I am perfectly satisfied with the mill; it ought to be started on custom ore at once. I can secure enough custom ore to run 15 tons daily. The prospects of the Basye Mines look very well, and only require development to ensure good results. Investigating Pinto closely; full report on July 26."

All must admit, therefore, that at its first meeting the present company commenced under very auspicious circumstances. (Hear, hear.) The directors had remitted 1000*l*. and instructed their agent to draw on them at sight for another 1000*l*.; they had also given orders to start the mill at once, and commence working at the Basye Mine. The secretary had written to Nevada, confirming the telegraphic instructions, and also arranging as to the Pinto debt and other matters. The mill would be at work now. When Mr. Murphy's report arrived in England a copy of it would be sent to each shareholder. There was, no doubt, ample ore in the property. A Californian company, called the Pinto, had been organised, with a very large capital, to work the mine immediately adjoining the Basye, and there were others close by, each of which were yielding large quantities of rich ore, all of which must come to this company's mill to be treated. Besides which there were prospects that ore was again coming in at the Pinto Mine. The prospects of the company were most cheering, for, without any profit derivable from the mines, they were assured there was ample custom ore to keep the mill fully employed, which alone would pay the interest on the debentures, and some dividends besides upon the shares. The profit on milling the ore would be 4*l*. per ton which would be equal to 15,000*l*. per annum. He strongly urged on the shareholders the necessity of paying the 10s. per share at once. In sending out Mr. Murphy the directors had put their hands in their own pockets, and subscribed the money necessary. They were largely indebted to Mr. Bell, who had taken an enormous amount of trouble in ensuring the success of the company, and he (the Chairman) hoped and believed that those shareholders who had not deserted their flag would reap the advantage by-and-bye. He was perfectly certain they would. As an instance of good fortune in mines, he might mention that while in Australia he belonged to a mining company, having given 600*l*. for one share; in six weeks the price went down to 60*l*., and those who did not desert the company received the enormous dividend in 18 months afterwards of 100*l*. per week. He mentioned that merely as an instance of what may be done by developing a mine which they had every reason to believe was a good one.

Mr. BELL, in reply to questions, stated the directors would be glad to issue the whole of the debentures immediately. As to Mr. Murphy, the directors had made every enquiry as to his character and ability, and Mr. Bewick, whose reputation was second to none in England, examined Mr. Murphy very closely, and had assured the board that no man he had ever met was more competent to undertake the management of the mine. Mr. Murphy would be under the supervision of Mr. Paxton and Mr. Plaer. There had been 14,000 shares applied for, with a 10s. liability. Mr. Murphy had agreed to put the mines in working order, start the mill, and do everything necessary, for 3500*l*.; but the directors considered 7000*l*. the lowest amount that should be at their command. He, therefore, urged upon the shareholders to pay up in full. The Pinto Company came to grief solely for want of funds, for had it not been wound up it would now be a very successful company. By subscribing to the Basye Company a bonus was obtained of the same amount in debentures, which he really thought were safe to get their interest. A power of attorney had been sent out to Mr. Paxton, who was well known in Nevada, to look after the company's interest, and he had written, in reply to a letter from the directors, accepting the trust.

A vote of thanks to the Chairman and directors closed the proceedings.

PLYNLIMMON MINING COMPANY.

A meeting of shareholders was held at the offices, Austinfriars, yester lay (Friday),—Mr. WINGROVE in the chair.

Mr. E. ASHMEAD (secretary) read the notice convening the meeting, and the following reports:—

July 25.—In conformity with your request, I beg to hand you a report on the progress at the above mine since you did me the honour of placing me in charge thereof. The 36 fm. level has been extended west from engine-shaft 1 fm. 5 feet in a lode about 1 foot wide, composed of clay-slate, mundic, and blende, with occasional stones of lead ore, but not at any time sufficient to value. The lode in the present end is small and poor. The driving of this level was suspended in April month, and the same men put to drive the 24 fm. level west; this level has been lengthened 4 feet only in a very promising looking lode, 2 feet wide, principally composed of killas, blende, and mundic, with small branches of lead ore, but not of any commercial value. The men that were engaged here having left the mine, I have not as yet been able to replace them. I strongly advise the continuation of this level in order to prove the western section of the mine. The 24 fm. level has been driven east from engine-shaft 12 fathoms 4 feet, in a lode varying in size from 2 feet to 6 in.; in the present end it is 2 feet wide, composed of killas, blende, mundic, and good stones of lead ore, producing saving work for dressing-floors. The end of this level having for some time passed under where good ore ground is standing in the bottom of the level above, leads me to believe this pipe of ore to be dipping east, and it is may firm belief that this end is now about to enter a good length of highly productive ground, as from over the present end to the eastern extremity (as far as proved) of the ore ground standing in the bottom of the 12 fm. level, there are about 90 fathoms: hence, in my opinion, this level cannot fail still to open out a good length of paying ground. The driving of the 12, east of engine-shaft, has been continued uninterruptedly, and has been lengthened 13 fms. 5 feet, in a lode varying in size from 2 feet to 1 foot wide, composed of blende, mundic, and lead ore, fluctuating in value from 2 tons to ½ ton of the latter per fathom; for the last 3 fathoms in driving the lode has been disordered by a channel or ridge of slate, which, when passed through, I have no doubt of its again becoming productive. The lode in the present end is small, carrying blende and occasional spots of lead ore. The cross-cut north from this level has been pushed on with all available speed, and has been lengthened 10 fms. 2 feet 4 in.; our progress at present is slow: there being only two men, which I hope to increase to four or even six shortly, I calculate to reach the lode in about three months. The adit level has been lengthened eastward 5 fms. 3 feet 4 in., and being off the lode a cross-cut northward has been commenced in April month, which, after being extended 12 fathoms, intersected the lode, which at point of intersection is 1 foot wide, composed of killas, blende, and lead ore, producing of the latter 1 ton per fathom, with every indication of further improvement. Judging from the level below, and the easterly dip of the ore ground in this section of the mine, a long run of productive ground may reasonably be expected at this important point, there being upwards of 30 fathoms backs over the present end, with rising ground at surface in advance eastward. A new shaft below the adit was commenced in March, which is completed to the 12 fathom level, where a plat has been cut preparatory to sinking same to another level. The rise over the adit has been carried up 2 fms. 5 feet 7 in., and communicated with a new shaft sunk from surface 6 fathoms 1 foot: this shaft, with the exception of being collared, is now complete from surface to the 12 fm. level, and the carpenter is busily engaged in preparing pulley stands and erecting same, so as to commence drawing as soon as possible. At present there are two stopes being worked by eight men in the back of the 12 fm. level, producing respectively 1 ton of lead ore per fathom. Our machinery is in good working order, and drawing and dressing being pushed on as fast as possible. We sampled yesterday 40 tons of lead ore for sale on August 1. In conclusion, I would observe that during the time embraced by this report your mine has greatly enhanced in value, the 12 fm. level having opened out a good length of productive ground, and the intersection of the lode in the adit level will also open out another good length of stoping ground over the same; also the prospect of soon meeting with an improvement in the 24 fm. level are all but certain, and should the present price of lead ore continue I have great hopes of soon bringing the mine into a dividend paying state. I shall be most happy to furnish you with any further information you may require.—J. GARLAND.

July 29.—I would remark that, looking at the improvement at the adit and the favourable prospects of the same at the 12 and 24 fm. levels, I have no hesitation in predicting a bright future, and firmly believe that at your next annual meeting you will be able to give something in the shape of a dividend. Every exertion will be made use of by me to obtain that object. Respecting the reserves of ore at present existing in the mine, it is difficult to estimate them with justice. I estimate them at a minimum (700 tons), including the ore ground standing in the bottom of the 12.—JOHN GARLAND.

The Special Report of Capt. T. Hodge (of Caegynon Mine) stated that the 36 west end is driven about 10 fms., the lode in which is rather in a disordered state, and suspended. The 36 east end is driven about 8 fms., reaching the hard floor of ground; very properly suspended. The 24 west end is driven 30 fms., the lode in the end yielding mundic, with occasional stones of blende and lead; the rock is a blue clay slate of a favourable kind; idle for want of men. The 24 east is rapidly improving as we advance, the lode being now 2 ft. wide, yielding saving work for blende and lead, and from its appearance it may enter a continuous bunch of ore at any time; this end is about 15 fms. behind the new shaft. The 12 east end has fallen off in value in the last few feet driven; the present end is improving, yielding some fine lumps of ore. One stope in the back of this level is yielding 1 ton of lead ore per fathom. The 12 north cross-cut is going out in a very favourable rock for producing lead; the lode is expected in the next 10 fms. driving, and the chances for a productive lode are favourable. In the adit north cross-cut the lode is expected daily; below this point, in back of the 24, is a valuable lode, so that it is more than probable that a good lode will be met with here. The new shaft is in a forward state; another fortnight will complete it to the 12, when the sinking below the said level will be commenced in a good lode, worth from 3 to 4 tons per fathom for the length of shaft, 12 ft. Scarcity of men is greatly felt here at present; only one stope at work, which is yielding about 10 tons a month, but if the bargains were fully manned three stopes ought to be going, which, with other bargains, would yield at least 35 tons a month, leaving a profit of 150*l*.; the mine will bear this for some time, even if no discoveries were made. The reserves are nearly as much now as at any former period; the slimes at surface appear to be very much neglected; I may be within bounds to state that no slimes have been dressed since the mine has been at work; large heaps are lying about which contain many tons of lead. The machinery at surface is in pretty good trim, and I am pleased to say that all below is going on in a miner like manner. The new shaft which was so long neglected, either from want of knowledge or forethought, is now finding its way down rapidly, and by the time that this shaft gets down to the 24 the new north lode will be intersected, and if found productive, as we may be reasonably led to expect, this mine will enter on a great run of prosperity.

The CHAIRMAN: This is the ordinary general meeting of this company, called for the purpose of submitting the balance-sheet for the past year for your approval, and for the usual routine business of re-electing such directors as retire from office. We have not issued any separate report on this occasion, for the two reports published—one from Mr. Hodge, when he had just returned from a careful survey of the property, and the other from Capt. Garland so late as July 25, which gives in detail all the information regarding the property which the directors possess up to the present time, with the exception of a subsequent letter dated July 29, which arrived too late for publication, it is simply an addendum to the report of Capt. Garland, and which I think you will agree with the directors as considering very satisfactory. It is in reply to questions from the board. The amount of ground worked since our last annual meeting is 257 fms., and the stoping has altogether amounted to 164 fms. In conclusion he says:—"I would remark, that looking at the improvement at the adit and the favourable prospects of the same, I have no hesitation in predicting a bright future, and firmly believe that at your next annual meeting you will be able to give something in the shape of dividends. Every exertion will be made use of by me to obtain that object. Respecting the reserves of ore at present existing in the mine, it is difficult to estimate them with any degree of justice, but I estimate them at a minimum of 700 tons, including the ore ground standing in the bottom of the 12." As it is now approaching the season of the year when manual labour becomes a little more plentiful, I hope hence orth to give regular returns, and by keeping the cost as low as is compatible with just economy I hope to have a balance on the right side." There are very favourable features in the report we must admit, more especially in the cross-cuts from the adit, where he has cut the lode, and assumes it to be worth 1 ton a fathom for 30 fathoms of backs, which adds materially to the value of the mine and its future prospects. I will now refer to the balance sheet, which you will see differs very little from that presented to the shareholders last August, which was made up to May 24. In this balance-sheet there are 13 months' costs instead of 12 as in the former; and the items are very much the same. The balance for the year's working shows a loss of 211*l*. 11s. 6d., but the capital account has been credited with about 800*l*. expended on works not chargeable against revenue. The preliminary expenses have also been reduced by a sum written off to revenue account—81*l*. 7s. 9d. You will notice that 357 tons of lead ore sold from May, 1871, to May, 1872, produced 4282*l*., whereas 288 tons 13 cwts. sold from May, 1872, to May, 1873, produced 4052*l*. 15s. 2d. The monthly cost is 363*l*., against 323*l*. last year. We show a balance of assets over liabilities of 2941*l*. 16s. 2d., which is, in the directors' opinion, amply sufficient to meet all requirements, and that the account at this moment looks exceedingly well. Forty tons have been sold to day; the prices are not now so high as they were a month ago, but they maintain a good value. There was 6*l*. short charged in the last account.

A SHAREHOLDER asked what amount of ore had been sold during the past six months?—The CHAIRMAN: Only 90 tons. Captain Garland was appointed in February last, as the board thought a greater amount of energy might have been put into the working of the mine—(hear, hear)—and they removed Captain Paul, and appointed Capt. Garland in his stead. At present we feel satisfied with Capt. Garland's management, it is no fault of his that only 90 tons have been sold, it is through the shortness of men: if we had had sufficient labour to make all the stopes we could have kept up the average of 40 to 50 tons a month. Our mine is situated in a very out-of the way place, and there is a great difficulty in getting men to stay there. Some months ago we printed a hand-bill in English and Welsh, in which we offered the men lodgings rent free for every six months, but that inducement failed to get the men. You are, doubtless, aware that a great impetus has been given to the coal working in South Wales of late which has drawn the labour away from the mines, but possibly when the reserves in the mine are more fully established it will become a matter of consideration for the board whether it would not be well to build cottages; and, in fact, make a little village, which would enable them to establish themselves. The mine is not a dangerous one. There are about eight or ten cottages, with an inn, but there is at present a grievous fault in the eyes of the miners—there is no public-house. The rents mentioned are received from the cottages I have just alluded to.

A SHAREHOLDER suggested that 5s. a week extra pay should be offered in order to secure men.

The CHAIRMAN replied that it was a dangerous thing to begin, as the example would be followed by other mines; he thought that building cottages would be a greater inducement to them.

Capt. GARLAND, in answer to various questions, said that there were at present 70 men at the underground workings, principally opening ground. There were only four men stoping, who could do about 10 tons a month. He thought that they would have plenty of men in a month or two (say about August or September). When he had taken charge of the mine almost all the available reserves were exhausted. He was more sanguine of success now than when he first saw the mine.

The motion for the adoption of the report was then seconded by Mr. F. COPE, and carried unanimously.

The retiring directors, Messrs. Moncypenny and Wingrove, and Messrs. Brandt, Stansfield and Co., the auditors, were re-elected.

Mr. COPE thought that great credit was due to Capt. Garland, who had taken the mine when it was in a bad condition, and to whom the improvement in their prospects was entirely due.

A vote of thanks to the Chairman then closed the proceedings.

GREAT WHEAL LOVELL MINING COMPANY

A meeting of shareholders was held at the offices of the company, Gresham Buildings, Basinghall-street,

Mr. J. H. HITCHINS in the chair.

The accounts showed a debit balance of 1009*l*. 13s. 11d. A call of 8s. per share was made. The agent's report was read, as follows:—

July 30.—Since the last meeting, in April, Hitchins's shaft has been completed to the 34, and about 3 fms. driven east and 4½ fms. west. At the time of the last meeting I stated that there was a favourable change in both ground and lode, and I am very pleased to say that it has gradually improved up to the present time, and there is every probability of much further improvement as the lode is opened on. As a rule with all the lodes in this district, the sheets of tin dip east, and as far as this lode has been opened there has been no exception to the rule. The first indication of the change we had in sinking from the 24 to the 34 was in the west end, gradually extending the full length of the shaft. Just at the point where driving west commenced the lode gradually improved in produce from 7 to 28 lbs. of tin to the ton, and is now worth fully 5*l*. per fathom, which can be stoped for about 3*l*. per fathom. The lode in the east end is small, and in close ground for driving. This is quite distinct from the shoot west and in bottom of the shaft. Hitherto scarcely a drop of water was to be seen in this end, but it is getting wet, which is a sure sign for the better. This gives me great hopes that it will soon drain Grans's winze commenced in bottom of the 24, about 10 fms. east of shaft, which when sunk through to the 34 in a I probability there will be large quantities of profitable ground to take away.

Our main chance of success is to sink the shaft, and to my mind without the least doubt the lode will improve as depth is attained. Our prospects are very encouraging indeed, especially westward and in depth; and although the east end is hard and poor at present, I am not the least dubious as to getting in it under the ground driven through in the level above. The number of men employed underground is twelve—six driving east and six west. Before commencing to sink plat must be cut and barrow road made across the shaft, which will take nine men one month to complete, also cistern plat for fixing plunger lift in should be cut, which being done as the shaft is being sunk will not take much time or money. We can sink 10 fms. before fixing the plunger at this level. The cost of sinking the shaft will be about 30*l*. per fathom, and of driving these two ends in the 34 from 8*l*. to 10*l*. Grans's winze is resumed by six other men, at about 12*l*. per fathom. If this lode

should continue only at its present value in the west end and shaft I think we may safely calculate on getting 50*l.* worth of tin per month from these two points alone. The water at present is very little indeed, the whole cost of working the engine, including enginemen, grease, oil, coal, &c., not exceeding 25*l.* per month; as winter comes on so will this item increase, but not to a very great extent. On the whole, our prospects are good.—J. BRAY.

A vote of thanks to the Chairman terminated the business of the meeting.

LADYWELL MINING COMPANY.

The statutory meeting of shareholders was held at the offices, Great St. Helen's, on Thursday,

Mr. THOMAS CLEMENT MUNDEY in the chair.

Mr. F. R. WILSON (the secretary) read the notice convening the meeting.

The CHAIRMAN said the present was the formal statutory meeting, held pursuant to the provisions of the Companies Act. He mentioned that there was 10,500*l.* on deposit, and that the shares were well held by a highly influential proprietary. The directors were well satisfied with the position and prospects of the mine. Two of them, Mr. Palin and Mr. Brooks, had just paid a visit to the mine, and were more than pleased with the result of their visit and the favourable prospects the mine presented. So far the mine had fully responded to the most sanguine expectations of Capt. Arthur Waters, the manager. The report was read as follows:—

July 28.—With my original report (already published) fresh in your memory, there will be no need for my writing a long story about the mine for the meeting to morrow. Looking back to the said report, it will be satisfactory to the shareholders to know that the various points taken in hand by the company have unfolded indications of such high promise, and the ends north and south on Gunter lode and main lode show more lead ore, and finer prospects than anybody could have expected at this early period, that there can now be no doubt as to finding a great and lasting mine in depth. The cutting down and timbering the flat-rod shaft is progressing with fair speed, and I hope to get this part of the work finished by end of next week. The pitwork will then be arranged, and preparations made for sinking below the 16 fm. level. The engine-shaft will also be commenced below the said level in course of a few months from now. As the sinking of the said shaft goes on winzes below the 16 south will be carried down in the ore ground, and we hope in that way to get into a good position rapidly.—A. WATERS.

Mr. PALIN expressed the most perfect confidence in the ultimate success of the mine, stating that the stuff already being returned was in every respect identical with that from Roman Gravels at a similar stage of its development.

Mr. BROOKS said he was a very large shareholder, and the result of his recent visit certainly did not cause him to regret that he had recently refused a good premium for his shares.

A vote of thanks to the Chairman and directors closed the proceedings.

TINCROFT MINING COMPANY.

At the meeting, on Wednesday (Capt. Teague in the chair), the accounts show a credit balance of 661*l.* The agents' report stated that the mine never looked better than at present.——On the motion of Mr. HINGSTON, seconded by Mr. SHILSON, the accounts were passed, and the report adopted; and, on the motion of the CHAIRMAN, a dividend of 1*l.* per share was declared. He (the Chairman) remarked that it was not so much as they were in the habit of making, but as they got poor they must submit to circumstances with as much grace as possible.

On the motion of Mr. SHILSON, a vote of thanks was passed to the Chairman, who, in response, stated that the price of tin had militated against them, as it was 9*l.* per ton less than last quarter, which made a difference of 1800*l.*, and there was the high price of coal and labour still to contend with. They need not, however, despair. He had seen things nearly as bad as they were now, and he believed he could see his way out of the present difficulties. He believed the price of tin would not always be down, and he was very glad to say that the mine never looked better than at present, and if the men worked a little better, and the price of materials came down, they would again get 25*s.* per share, and he trusted he would be able to meet them for many years with better results, although the present returns were not bad in these times.

CARN BREA MINING COMPANY.

At the meeting, on Wednesday (Capt. TEAGUE in the chair), the accounts showed a credit balance of 739*l.* The Chairman remarked that they had not quite earned 2000*l.*, but as they had been keeping a balance of 5000*l.* he thought it would not be robbery if they declared a dividend of 2*l.* a share, which would reduce the balance a little over 100*l.* A dividend of 2*l.* per share was declared; and, in reply to a vote of thanks, the Chairman said that in Carn Brea he had done the best he could for the shareholders and himself. He regretted that he was unable to declare a larger dividend; but, taking everything into account, he thought they had not done so badly. They could not fail to perceive that they had gone on increasing their returns, and he believed that things would take a turn for the better by-and-bye. From the closing of some of the concerns around them labour would be more plentiful. Men preferred working in shallow mines, but he was afraid many of the shallow mines would have to close. They were, of course, greatly dependent upon the price of tin, but they could not lose sight of the fact that the stock of tin in Europe was decreasing. There were those who tried to make them believe that the demand for tin was not very good, and that all the foreign tin that was being brought into the market tended to depress mining. It was a fact that mining had been depressed, but if they looked at the fact that the stocks of tin were decreasing, and that the mines were closing, they must come to the conclusion that the quantity of tin raised was less than formerly. When the tin was 45*l.* to 50*l.* per ton the product was something like 1500 or 1600 tons a month in Cornwall and Devon, and he questioned whether they were now raising more than 1200 tons a month, and which would leave a deficiency of 300 tons a month. They were told a great deal about Australian tin, but supposing they got 300 tons a month from Australia they would only have the same quantity as before, and they must not forget that the world was growing bigger, and that what would satisfy it ten years ago would not satisfy it now. He, therefore, believed there was a better future before them. He believed the better day had dawned, and that the downward tendency had stopped, and that the next movement would be upwards. If the demand for iron fell off coals must be cheaper, and he had reason to hope that the results of mining would be better in future than they were at present.

[For remainder of Meetings see to-day's Journal.]

FOREIGN MINING AND METALLURGY.

Upon the Paris market copper has given rise to comparatively few transactions, although previous prices have been about maintained. Chilian in bars has made 85*l.* 10*s.*; ditto in ingots, 88*l.*; and Corocoro minerals (pure copper), 86*l.* per ton. The question of certain proposed taxes on metals is naturally exciting a good deal of attention in France. Copper has been very quiet in Germany, but, nevertheless, prices are maintained tolerably well. Tin is declining at Paris: Banca, delivered at Havre or Paris, has made 144*l.* per ton; Straits, ditto, 150*l.*; and English, delivered at Havre or Rouen, 147*l.* 4*s.* per ton. The past week has been a very quiet one for tin upon the Dutch markets: Banca has made 79½ fls. to 79¾ fls.; and Billiton, 78½ fls. Lead has been rather drooping in France. At Paris, French, Belgian, and German lead, delivered at Paris, has made 23*l.* 12*s.* per ton. In Germany lead has not experienced much change. Zinc has been rather weak in Germany, and prices have been, to some extent, nominal. Silesian zinc, delivered at Havre, has made 27*l.* 4*s.* per ton at Paris, and other good marks, with delivery at Paris, have brought 27*l.* 8*s.* per ton in the same capital.

The revival which some had anticipated in the French iron trade does not take place, and the hopes of French ironmasters appear to be almost daily declining. Neither the fall in prices which has been attempted, nor the reduction in production which has also been essayed, have brought back orders to a sufficient extent, and the situation has become difficult. In the Champagne group almost everything is declining, from pig up to fine iron; machine iron has alone maintained its ground, and even this result has not been secured without difficulty. In the Ardennes ordinary white pig is dealt in at 4*l.* 16*s.* to 5*l.* per ton, and merchants' iron at 11*l.* 4*s.* per ton; there has been scarcely any business passing upon these terms. The rail market in some districts shows a little animation. MM. Schneider and Co. are naturally elated at having vanquished Belgian competition in Belgium itself, and at having triumphed also over English competition on the same occasion. The imports of pig into France are shown by official documents to have increased in the first five months of this year to the extent of 10¾ per cent.; on the other hand, the imports of iron and plates in the same period presented a diminution of 5 per cent. The exports of iron from France increased in May, but for the first five months of this year they presented a diminution of 10¼ per cent., as compared with the corresponding period of 1872.

Tenders have been received for rails for the Belgian State Railways. For the delivery of 24 lots of 500 tons each of Bessemer or Siemens' steel rails, with iron fish-plates and other accessories, the following firms tendered (the names are arranged in relative order in respect to their rates of tender, the first named being the lowest)—MM. Schneider and Co., Creusot, France, with delivery at Erquelinnes; MM. Tiden, Nordenfelt, and Co., of London, with delivery at Antwerp; the Ebbw Vale Steel, Coal, and Iron Company (Limited), with delivery at Antwerp; the Cockerill Company, with delivery at Liége; MM. Adhemar Le Roy and Co., of Molenbeek, St. Jean, with delivery at Antwerp; Messrs. Brown, Bailey, and Dixon, of Sheffield, with delivery at Antwerp; Mr. Fowler, of Brussels, with delivery at Antwerp; the Angleur Steelworks Company, with delivery at Liége; the Sclessin Company, with delivery at Liége; and the Bochum Company, with delivery at Bochum. The lowest price (that of the Creusot Works) was 18*l.* 2*s.* 6*d.* per ton; and the highest price (that of the Sclessin Company) was 19*l.* 2*s.* per ton. Tenders were also received for 24 lots of 500 tons each of Vignoles iron rails. The lowest tender was that of MM. Blondiaux and Co., of Thy-le-Chateau, 11*l.* 4*s.* per ton, with delivery at Charleroi. Tenders at sensibly higher rates were also delivered by MM. Tiden, Nordenfelt, and Co., and the Ebbw Vale Steel, Coal, and Iron Company (Limited). Old rails from the Belgian State lines were tendered for at 5*l.* 8*s.* per ton.

In France if a downward movement has not set in in coal it may, at any rate, be said that few now entertain hopes of an advance. The state of the French iron trade has become more discouraging, and this circumstance is calculated to cause the most sanguine lookers-on to indulge in very serious reflections. Upon the Paris market English coal now arrives in profusion; the quality is good, and the careful manner in which deliveries are made is regarded as indicating a desire on the part of English firms and companies to regain a market which they have been on the point of losing. A contract for 30,000 tons of the best Newcastle coal has been concluded at 1*l.* 4*s.* 10*d.* per ton; and some French and Belgian coalowners, alarmed at the course which events have taken, are said to be making serious concessions or abatements from the official prices. Consumers, on their side, remain on the defensive as much as they can, and do not conclude transactions at current prices except for the quantities which they indispensably require. In the North of France English coal is sharply competing with native coal, which is disposed of with some little difficulty in consequence. In the basin of the Loire, which is independent of the northern markets, and subject only to local influences, coal quotations are still maintained with firmness. There is something like a panic in the French coke trade, and prices have been everywhere declining; at the same time, the fact must not be overlooked that new blast-furnaces are still being constructed in France.

The Administration of the Belgian State Railways is stated to have declined to accept any of the tenders which have been recently submitted for the supply of coal to the lines under its control. This course has furnished a fresh argument to the advocates of a decline in quotations. It is tolerably well known that the State establishments are at present well off for coal, and it is more than probable that for the small quantities which it still requires the Belgian Government will accept the offers made to it from hand to hand—offers which are made on terms notably below those mentioned in the tenders recently delivered to the Administration of the State lines. Continued firmness in prices may be said to be the order of the day in all the Belgian basins, but it cannot be denied that many concessions are made unofficially, and that the movement for a fall makes continued progress. The press is becoming almost unanimous upon the subject, and it is not surprising that this should be the case, since almost every one is suffering from the depressing influence which the excessive and prolonged rise in prices has imposed upon industry. A quotation of 1*l.* 16*s.* per ton for coke is again beginning to be talked of in Belgium. Good coke still commands a somewhat higher price than this, but at the same time the coke trade is evidently suffering from the weakness of the Belgian iron trade. The Belle Vue Colliery Company commenced the payment on Thursday of a first dividend for 1872 of 2*l.* per share.

FOREIGN MINES.

PORT PHILLIP AND COLONIAL (Gold).—Telegram, Melbourne, July 25: Month ending July 16: Yield per ton, 4 dwts. 16 grs.: remittance, 900*l.*

DON PEDRO NORTH DEL REY.—Telegram from Lisbon: Produce weighed to June 30, 1676 ozts.: estimate for June, 2800 ozts.

SWEETLAND CREEK.—Telegram from the superintendent: We have cleared up after a run of 63 days. The gross returns are 37,500; the profit is 23,500. I send you a remittance of 25,000.

FLAGSTAFF (Silver).—Telegrams: One furnace running four days realised 20 tons; bullion value, 1100*l.*—Maxwell. —— Ore realised for the week, 3200*l.*—Maxwell.

RICHMOND.—Cablegram from the mine at Eureka: Hall, London. Week's run, 47,000.—Probert.

SNOWDRIFT (Silver).—Telegram: Eastern adit cut; lode good ore.—Foster.

BIRDSEYE CREEK (Gold.)—G. S. Powers, July 7: In answer to your letters of enquiry, I will first give you the entire length of Neece Brown's Hill Channel, which is 800 ft., or nearly, and from the best information I can get there yet remains of the undrifted portion above 600 ft. in length, varying in width from 500 to 700 ft.—Walonga: The washing that has been done on this mine is entirely above bed-rock. The channel, which is nearly 700 ft. in length, has never been bottomed, and my plan of working this pieces of ground would be this, as my present sluices are plenty, even to work the back ground, that I would wash past the deep channel in a short time, then the company could sink a shaft to ascertain the depth of gravel, which will also give length of tunnel required to unbottom the entire channel in Birdseye canyon. Neece and West Tunnel has not got depth to work much more than the ground belonging to these claims. All of Uncle Sam and Manory will have to be washed through a tunnel from Wilcox Ravine. I am only running Uncle Sam one head with water from company's ditch, with an additional 100 in buying from South Yuba, which will have to be increased as the water falls off in the company's ditch. I shall remove main ditch from Uncle Sam ground as soon as the water gets down to its lowest standard, which will be the end of present month, or first of August. The tunnel is making its usual progress, and I have strong hopes that it will be finished at the aforesaid time. I will send you vouches and mint memorandum in a few days for month of June, also a cablegram showing result of clean-up.

FRONTINO AND BOLIVIA.—The directors have advices (June 11 and 13) accompanied by the usual accounts, and a remittance of gold valued at 796*l.* 8*s.*, the produce of the mines for the month ending May 26. The following are the accounts for the month:—Cost at Frontino and Bolivia Mines, and expenses in London and Medellin, 1160*l.* 3*s.* 8*d.*; produce, 3405½ ozs. from 1885 tons of mineral (average yield per ton, 3 dwts. 15 grs.), 796*l.* 8*s.*; loss, 363*l.* 15*s.* 8*d.*

MAMMOTH COPPEROPOLIS OF UTAH.—July 12: Recent advices state that the mill will be completed in three or four weeks. The manager reports that a sample of the quartz rock taken from a face 30 ft. across gave 6·4 ozs. in silver, value 8*l.* 2*s.*; and 4 ozs. gold, value 8*l.* 0*s.*; gross value in silver and gold, 892*l.* 6*s.* Over 1000 tons of the quartz ore was on the dumps, and the mine captain states that he can get from 50 to 100 tons daily from the mine. Mr. Williams estimates that there are also 2000 tons of second-class copper ore from the north mine on the dumps, averaging 10 per cent. of copper, capable of reduction to black copper at a large profit. The workings, according to last week's report, have laid bare in the discovery shaft in North Hill Mine a 6 ft. face of high-class copper ore, and a drift at nearly right angles to the lode had been commenced on it. Such a find as this is full of promise.

EBERHARDT AND AURORA.—Mr. Frank Drake reports that with no prospecting being done to develope further resources, and no "dead work" to improve the condition of the mine, and render the extraction of the ore a less expensive process than it is at present, my monthly report on the "condition of the mine" must necessarily be somewhat meagre.—Ward Beecher: Here I have been working 26 men taking out ore from near the north end; the ore procured here will assay an average of about 850 per ton, but it has to be handled so much that but a small margin is left for profit.—North Aurora—North End: I have been taking some ore from the top of the east chamber; the ore is very much mixed with waste rock, which makes the assorting cost more than is desirable. Altogether from this end of the mine (including Ward Beecher) 150 tons have been extracted during the month (June).—Pearless Chamber: This chamber has furnished us with 648 tons during the month; it is looking well, the ore continuing north and west, also on the bottom. At the south west corner we are at a depth of 55 feet from top of chamber, or 181 feet from surface. I have no fear but that I can supply the Stanford mill with sufficient ore of a good grade from this chamber to fill the balance of the contract at least.—Eberhardt: No work is being done here at present. As indicated at the commencement of this letter, I have done but little "dead" work, but shall during the present month commence sinking the Ridedale shaft to connect with the Pearless chamber. I have four men at work in a drift running east from the Central shaft, and following a feeder which gives promise of leading into a body of ore. Altogether, I am better satisfied with the appearance of the mine than at any period since I assumed the management. The monthly statement of accounts will be forwarded in a few days.

MALABAR (Gold Washing).—Advices from the agent, June 18, announced the arrival of Mr. G. B. O'Reilly, the superintendent, and the Californian staff. During the past month the whole length of the new ditch had been staked out and men put to work on it, making the embankment 12 ft. in width in solid ground.

RICA (Gold Washing).—Mr. C. R. Clarke, June 16: Mr. Skinner has done but little washing, yet on account of scarcity of water. What he has done has been quite satisfactory; he has exposed a cinta of bottom gravel that prospects very well; it it quite thin now, running from 6 in. up to 2 ft. thick, but in all probability will increase as we wash into the bank. Mr. Skinner is quite pleased with the appearance of gravel now exposed. Mr. Skinner sent me word that he should start the machine again this morning. We have since starting advanced towards the banks 150 ft., and if it will only rain and give us water shall reach them in less than two weeks. I am in hopes in my next I shall be able to give you some encouraging reports on the bottom gravel, which, so far, is still unexplored, but I am in hopes will turn out rich.

MALPASO.—C. R. Clarke, June 17: The mine is still improving, and I have a better opinion of it now than ever, for reasons which I will explain hereafter, but I am sorry to have to write that at present our water is totally inadequate, and that the amount of dirt now removed is very small, but notwithstanding all this I hope to give you an increased return next mail. During the past five months there has been but little rain, and all over this section the water is very short. The Sucio river, which last year was very often impassable, has not for months been above a horse's knees, and now you can ride across it without raising your feet or getting them wet, and now is the commencement of what is called here the dry season. If it should continue dry two or three months longer our water would dry up entirely; this proves that we must bring in another ditch. When I first examined the Quebrado, Cantelera, the natives told me that there was never less than one half the amount of water there that I then saw, and it measured then just at the brink of a fall where it run very rapid 8 ft. wide, and from 1 ft. to 2 ft. deep, but since that my experience has taught me that there was no faith to be put in anything told by the natives, and our water to-day is down to about 100 in. All the dirt we have removed from this run so far could be moved in a week with 400 in. of water. We started with 600 ft. of sluice; since then we have added on at the lower end 420 ft., and at the upper end 370 ft., this week we will put on to the upper end 40 ft. more. The banks now being on 80 ft. ahead of the sluice, I am washing on the top of hard cement, but carrying cut up through it to keep my sluice down to its regular grade; have also narrowed my opening so as to advance more rapidly towards the main banks and develope our true resources as soon as possible. After we get to running day and night we intend to remit once a month, so I shall probably from next month on send you a gold bar each monthly mail. We are already to commence running night and day, and I think I shall put the night shift on about June 23.

The agents further writes:—The gold-bearing gravel worked by the Spaniards forms a wide belt crossing the estate, and the mines denounced are only a few of the most important points on that belt; the direction of the main lead cannot be ascertained until one of the mines is opened out. The upper portion of the estate has hardly been explored, but from the ground I have seen in the new ditch I anticipate that coarse gold will be found in abundance in the valley of the Medina, in gravel of quite a different character from that worked by the Spaniards. I intend prospecting this ground, and will report the result to the board.

CHICAGO (Silver).—W. S. Godbe, July 12: During the night of the 10th inst. work was stopped on the hired furnaces, having treated about 700 tons exclusive of moisture, Chicago ore and about 50 tons of purchased ore in a run of 30 days. A greater quantity could, if necessary, have been smelted, as the minimum amount of heat only was employed. I now send you the following cables. Four hundred and seventy tons of ore treated since last cable. The net proceeds are $12,000, and the gross proceeds therefrom are $23,500. As in the former instance the figures are only approximations, but will, I think, be very nearly correct. The net profits per ton that will be realised when the ore is reduced in the company's works I am confident will not be less than $40, and with sufficient hoisting works there will be no difficulty as to the quantity. On the question of transportation, I wish to say that while only the lowest current rates have been paid, cost is several times more than it will be in future.

NEW ROSARIO.—M. V. Cumins, June: I have placed some men to open the south ground in Providencia shaft. As already explained, the lode in this point is soft quemazon, through which we are able to drive 3 to 4 varas per week. So far there is no great change perceptible in the level going north in Providencia, except that the ground is a little easier, and the lode a trifle narrower, owing to its separation from the other lode that was underlying into it.—North Adit: A level, called the San Juan, has been commenced on the south part of the lode, and is driven about 4 varas. If the board have seen Mr. Peter Skewis he will have told them what a fine prospect we have of meeting with a rich bunch of ore in this south ground.

—Capt. J. Skewis, June 27: Providencia: The south end is now driven about 11 varas from the shaft, and a more kindly prospect than it offers can now be seen. The further we go on it the more kindly it looks, and there is no doubt that this will be one of the best mines that was ever discovered in this district.

TOLIMA.—May: Frias: The manager reports 27 fms. 5 ft. ground expended, of which 19 fms. 2 ft. 11 in. was unproductive, leaving 8 fms 2 ft. 1 in. productive ground, which produced 80*l.* 4*s.* per fathom of whole lode stoped. Writing under date of June 18 the manager states that "in the month of May a new water course was made to replace the old one, and collected the greater part of the water that had its course into the mine." He says that "this improvement caused the influx of water to be considerably less in both at No. 1 winze and at the upper working by the main adit level." He continues—"At the 20, the south-west station arrived at the junction of the main with the 45° Welton's lode; at this point the mineral branch increased in size, being a friable blende, probably decomposed by the union of the lodes, but produced rich smalls for the jigging machines. This will be a good addition next month's returns, when they will be hoisted to surface by the horse which I expect will be at work." Before closing his letter the manager reports that as at work. The manager goes on to say—"The north-east 20 fm. level continues on poor ground, but we expect to find good mineral at the point of 'horse' we are getting through at present."

No. 2 Yankee's Winze: This station yielded rich ore at the beginning of month, and disappeared soon; the lode, however, has still signs of mineral and looks promising. We have stoped about 2 fathoms of the reserved ground by side of this winze, which yielded ore of good quality; the branch of solid ore about 4 in. wide, and continues good towards No. 1 winze.—End on 45° West 10 Fathom Level: This end has been vigorously worked night and day, and level has been driven 4 fms. 4 ft. 3 in., 1 fathom of which produced more than 1 ton of rich ore for export, and now we are expecting to get into rich ground again in a report from the underground manager it is stated that in consequence of repairs being in progress at the extraction shaft it has been impossible this month (May) to hoist all the ore broken or now in the mine.

BUNKER HILL (California).—W. L. Palmer, July 8: The value of the ore we have taken out I expect to be fully as good as the last run in the mill. This run yielded in the mill over $16 (tailings, $3)—total over $19 per ton. The Sierra Buttes ore is excellent, and their $12 rock furnishes good dividends. The Keystone and Hayward Amador make their enormous monthly dividends on rock yielding in the main about $15 per ton. The cost of working being $8 per ton, two-thirds of the ore is profit. Ours yields over $15 in the mill contents, and no mine in the neighbourhood yields ores of a higher grade than ours. The new body of ore in the 170 is good ore; it has kept about the same as at last advices. The stopes are all looking first rate, and the ore in them is also looking No. 1 in quality. We are just now working in a ledge of ore 5 ft. thick in the hanging wall, and about 3 ft. thick in the hanging wall, of splendid rock. Everything going on in a way that is most satisfactory.

UNITED MEXICAN.—Edward Hay, Guanaxuato, June 24: Mine of Jesus Maria y Jose: The ore has improved a little in the reserves between St. Bernardo and San Carlos, where 14 workmen have been at work of late. In the end of San Juan north, in the Los Locas property, the lode looks more promising in the lowest workings but still the returns do not cover the outlay.—New Concern: Adit of San Cayetano and Mine of Buenos Ayres: Since a more westerly direction has been given to the end of the adit it has improved a little in appearance. It was surveyed on Friday last from the shaft of Buenos Ayres to the end, and have decided on carrying on the work in the direction of north-west 85° to approve the main lode, and on also opening a cross-cut due south, at a distance of 5 fms. east from the end, in order to determine the exact position of the lode.

BENSBERG.—J. W. Hoffman, July 26: The sinking of the Victoria shaft was continued without interruption this week, and 2 ft. progress was made, the total depth now being 56 ft. The ground is unaltered, hard limestone containing a great deal of iron pyrites, with specs of galena here and there. In the east the water has so far fallen that we have been enabled to go 3 ft. deeper on north vein, and are now getting carbonate of 38 per cent. assay from this. The steam-lift for the dressing-floors is now completed and works quite satisfactorily. All the dressing machinery has been in work since Thursday last and works well. The bridge from the inclined plane to the dressing house will be ready for erection next week. Production of ore for the week:—carbonate, 30 tons of 35 per cent. assay; rock ore, 10 tons, of 10 per cent. assay; delivered, 10 tons, of 35 per cent.; stock on hand (ready for market) 20 tons; assay 32 per cent. [The directors have declared an interim dividend of 8*s.* per share for the half year.]

MENZENBERG.—R. K. Roskilley, July 26: The shaftmen have been busily engaged during the latter part of the week in removing the ladders from Dickins's shaft, and putting it in order for the reception of the pitwork, they have driven it as far as the 25, so next week we shall begin to let down the pitwork. We have fixed the balance-bob in its place, and are at present employed in building the stand between the former and the engine house for carrying the flat-rods, which will be completed to-day. The stack is finished, and the masons are engaged in building in the boiler, in which good progress is being made; in fact, all the work is going on satisfactorily.

MR. HENRY SEWELL.—We learn from private sources, as well as the *Salt Lake Daily Herald* of July 6, that our old correspondent, "Mr. Henry Sewell, who had completed all arrangements to start for London within two weeks is to remain at Salt Lake as manager for the new Camp Floyd Mining Company, the old company having been placed in liquidation. We are pleased to congratulate Mr. Sewell and the company." All the papers mention Bingham as one of the best mining camps in Utah: indeed the present system of conveyance is not at all adequate for its increasing requirements.

CHICAGO (Silver).—A letter has been received (July 28) from Mr. Mackintosh, representative in Utah of Messrs. Lewis and Son, ore and lead merchants of Liverpool, in which he speaks very encouragingly of the future of the Chicago Mine. He says the mine is showing more ore in reserve than any other in the Territory, and that it will be one of the most successful operations floated in England. He speaks well of the management of the mine by Mr. Godbe.

CHICAGO (Silver).—Extract from the Salt Lake *Daily Tribune* of July 11:—"Yesterday Salt Lakers had a chance of inspecting one of four ore wagons just imported from California, by the Chicago Mining and Smelting Company through its manager, W. S. Godbe, Esq. These wagons were built by Mr. Hill, of California, specially for hauling ore, and are precisely the style of wagons adopted in the mining regions of California and Nevada, and which years of experience have demonstrated to be the very best that can be used. Each wagon is built to carry 5 tons of ore, 'rigged' for a 'back action' and eight mules. Every improvement that practical experience can suggest for carrying ore expeditiously and cheaply is incorporated, and their adoption by Mr. Godbe for hauling ores from the mines to the smelters of the Chicago Company, near Stockton, is an evidence of his good practical management of the affairs of the company."

WINAMUCK MINE AND FURNACES.—Reports of the working continue to be very satisfactory. The mine is systematically worked and thoroughly handled under the efficient superintendence of Mr. Pinedo. The quality of the ore has improved since the property came into the hands of the present English owners, also the yield is greater. An estimate may be formed the quality of the base bullion, from the fact that in the early part of the month a cardoad (16 tons) of it sold for something over $8000, or more than $800 per ton. During 23 running days, with one furnace shut down a part of the time for repairs, the gross yield was over $81,000, the net yield being about $52,000.—*Coast Review*, July.

GREATEST GAS WELL IN THE WORLD.—The Newton gas well, 6 miles from Titusville, Pa., discovered last year, still continues to pour forth its gaseous treasures at the rate of 3,000,000 cubic feet of gas every day of 24 hours. The gas issues under a pressure of from 20 lbs. to 30 lbs. per square inch, and is the most part goes to waste. Pipes have been laid to Titusville, and some 300 dwelling houses, shops, &c., are now supplied with the gas for illumination and fuel. For heating purposes it is admirable, but for illumination it requires to be passed through naphtha, as it is deficient in carbon. This well may be justly regarded as one of the wonders of the world. If the bowels of the earth in its vast unity were transparent, and the owners could satisfy themselves of the continuity of the gas flow, we presume that pipes would be laid from the well to several of the large cities, such as Pittsburgh, Cleveland, and Buffalo, distant from 120 to 150 miles. We believe that the quantity of gas delivered by the Newton well exceeds the combined supply derived from all other wells in the country.—*Scientific American.*

A splendid specimen of Australian tin ore, 1 cwt. or more in the lump, and very much resembling in appearance some we have seen in St. Just, is now on view before the Institution of Mechanical Engineers in St. John's Hall. This stone is from the Wellington Vale run, county of Gough, New South Wales, 100 miles from the Clarence river, and large mining operations are contemplated there on the recommendation of Mr. W. Wellington, a West countryman, in whose judgment and discretion Messrs. Bolitho place full confidence.—*Cornish Telegraph.*

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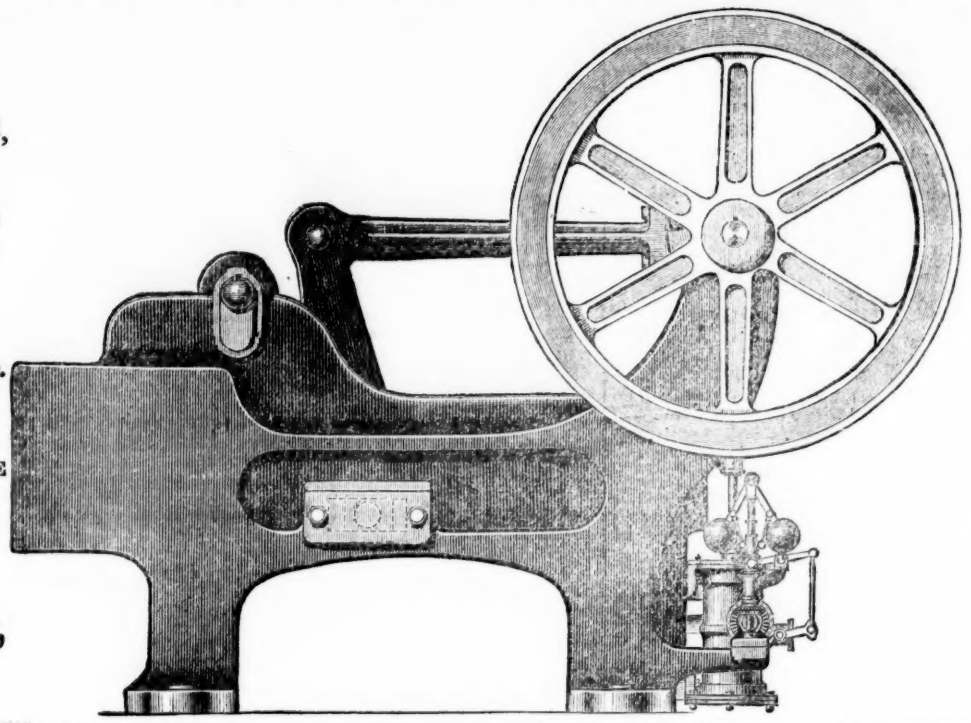

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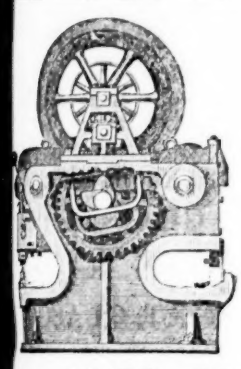

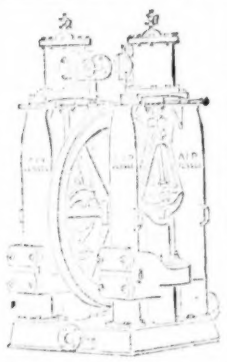

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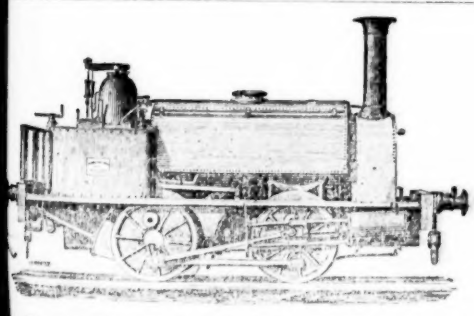

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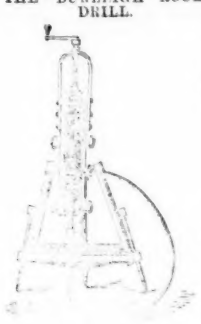

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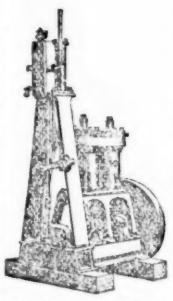

For driving the "Burleigh" Drill, or other Machinery.

The peculiar advantages which enhance the value of this Machine in the estimation of those who have it in practical use are—

1.—The pump pistons are driven by a steam-engine, the connection rods being attached to one crank shaft, the angles being so set that when the greatest power is developed in the steam cylinder the point of the greatest compression is being reached alternately in the air cylinders.

2.—The heat generated by compression of the air is reduced to *nil*.

3.—It is strong and durable compared with its effective power.

For further particulars, and all information relating thereto, please address—

T. BROWN & CO.,

ENGINEERS,

96, NEWGATE STREET, LONDON, E.C.;

WILSON, McLAY, & CO.,

SOLE AGENTS,

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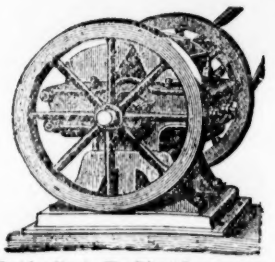
THE MAKERS,

VAUXHALL IRON WORKS, OSBORNE STREET, MANCHESTER.



Machine No. 1—The Direct Double-Action.

IMPROVED

PATENT STONE BREAKING, QUARTZ CRUSHING, AND GRINDING MACHINERY

Messrs. T. BROWN and Co., ENGINEERS, have much pleasure in calling attention to their IMPROVED MACHINERY for STONE BREAKING and QUARTZ CRUSHING, for crushing, grinding, and triturating Stone, Flint, Minerals, Ores, Chemicals, and other substances; for washing and separating Metals from Ores, and for extracting Gold from Quartz.

The principle of this invention is applied to machines of various construction, which contain within the range of their capability the power of reducing all hard materials to cubes of from 2½ inches to impalpable powder. The mechanical construction of each description of machine is specially adapted for its own peculiar work, and experience has shown that each is eminently suited for the work for which it is designed.

They can be driven by water, steam, or horse power; they are light and portable, and their crushing and grinding surfaces are so constructed that when worn they can easily be replaced.

If intending purchasers would send a sample of the material required to be crushed or broken it could be operated upon in their presence, and thus they would be guided in the selection of the machine best suited for their requirements.

For prices, and all information relating thereto, please address—

T. BROWN & CO.,

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Or their representatives,—

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CHARLES CHURCHILL AND CO.,

IMPORTERS AND FACTORS OF AMERICAN MACHINERY AND TOOLS,

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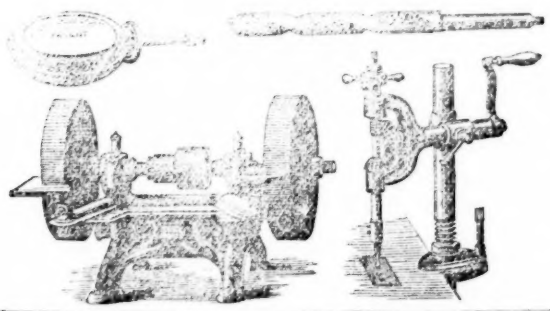
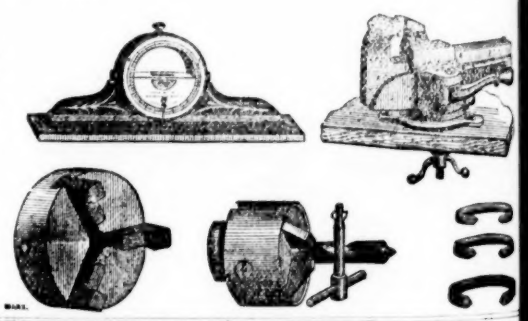


SOLE AGENTS FOR

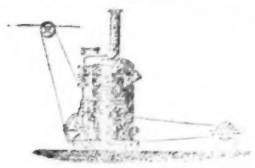
Morse's Twist Drill, and Machine Company's celebrated Twist Drills and Chucks; American Scroll Chucks; Stephens' Patent Vices; Parker's Patent Parallel and Swivel Vices; Gould Manufacturing Company's Well and Cistern Pumps; Washita, Arkansas, and Hindostan Oil Stones; and all other descriptions of American Tools and Machinery, &c., &c.

C. C. and Co. are prepared to give quotations and execute indents for American Goods of all descriptions, to be shipped to any port.

CATALOGUES AND PRICES CURRENT ON APPLICATION.



CHAPLIN'S PATENT STEAM ENGINES & BOILERS



STATIONARY ENGINE.

(PRIZE MEDAL, INTERNATIONAL EXHIBITION, 1862),

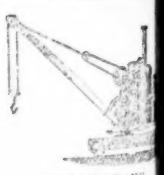
The ORIGINAL combined Vertical Engines and Boilers, introduced by Mr. CHAPLIN in 1855. Each class kept in Stock for Sale or Hire.

WIMSHURST, HOLLICK, & CO., ENGINEERS,

WORKS: REGENT'S PLACE, COMMERCIAL ROAD EAST, LONDON, E.

(At Regent's Canal, near Stepney Station).

CITY OFFICE: 117, CANNON STREET, LONDON, E.C.



STEAM CRANE.

JOHN BOURNE AND CO.,

ENGINEERS, SHIPBUILDERS, AND CONTRACTORS,

66, MARK LANE, LONDON.

COMPOUND WINDING ENGINES,

Inexpensive, easily handled, and very economical in fuel.

COMPOUND ENGINES FOR ROLLING MILLS,

Without gearing and fly wheel, and wholly exempt from break downs.

Pumping Engines, Blowing Engines, Steam Boilers, Hydraulic Machinery, Coal Washing Machines, Shearing Machines, Cranes, and all kinds of Apparatus required in Collieries and Ironworks.

CAPTAIN TREGAY'S

IMPROVED STAMP PATENT COFFER,

FOR STAMPING GOLD QUARTZ, TIN, AND OTHER ORES.

The gateway is extended, discharge doubly increased, and power economised.

May be inspected in full work, on application to Captain TREGAY, Redruth, Cornwall, who is PREPARED to TREAT for GRANTING LICENSES for its use, or to SUPPLY the MACHINES.

Established 1944.

WHITLEY PARTNERS,

RAILWAY WORKS, LEEDS,

ENGINEERS, FOUNDERS, AND LICENSEES.

MANUFACTURERS OF IMPROVED STEAM ENGINES, BOILERS, PUMPS, &c.

MAKERS, by Special Machinery, of PATENTED MECHANICAL INVENTIONS, comprising numerous Labour-saving Appliances and Economisers of Fuel and Motive Power.

CONTRACTORS TO THE EUROPEAN AND COLONIAL GOVERNMENTS AND CORPORATIONS.

MERCHANTS AND SHIPPERS OF MACHINERY, METALS, AND HARDWARE.

AWARDED

THE FIRST PRIZE MEDAL AT THE EXPOSITION UNIVERSELLE, PARIS, 1867, "For Improved Construction, Excellence of Material, and Superior Workmanship." TWO GRAND GOLD MEDALS AT THE MOSCOW INTERNATIONAL EXHIBITION, 1872. ALSO, THE FIRST PRIZE MEDALS AT LEEDS AND LYONS IN 1858, 1868, AND 1872.

REDUCTION IN PRICE OF PEET'S VALVES, CONSEQUENT UPON LARGELY INCREASED SALES.

ILLUSTRATED CATALOGUES AND ESTIMATES ON APPLICATION.

Correspondence conducted in English, German, and French.

Samples of Specialties may be inspected at Stand No. 512, Group XIII., in the English Machinery Annexe of the Vienna Exhibition, 1873. For list of same see German Official and "British Section" Catalogues.

ROCK DRILLING MACHINERY.

CHARLES BALL AND CO., lately Sole Agents for

THE BURLEIGH ROCK DRILL,

ARE N W PREPARED TO SUPPLY THEIR NEW

ROCK-BORING MACHINE, OR "POWER JUMPER,"

Which they consider far superior to any other Rock-boring Machinery existing, and which they have, therefore, undertaken to bring before the public. The Firm's principle

"INVENTORS OF NONE—AGENTS FOR THE BEST"

Secures to its customers the best known machinery, as the Firm is entirely impartial in its adoption of any particular style of machines.

THE "POWER JUMPER"

don Davidson, and Warrington's Patent.

References, particulars, Estimates, &c., Sent on application.

Is recommended to the public on account of its qualities, which are the following. It is—

CHEAPER,
SIMPLER,
LIGHTER,
SHORTER,
THAN ANY OTHER.
COMPARISON INVITED.

Secondhand
BURLEIGH DRILLS
FOR SALE.

CHARLES BALL AND CO., Mining Machinery Makers, 21, NEW BRIDGE STREET, LONDON, E.C.

WALD BROOKE AND CO.,

51, DALE STREET,
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MANCHESTER,

PATENTEES AND SOLE MANUFACTURERS
OF
GOVERNMENT
FIREPROOF

BRATTICE CLOTH

AND

AIR TUBING.

WORKS: COLLYHURST.

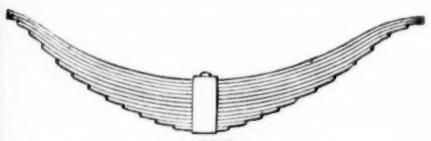
McNIEL, MULLER, AND CO.,

39, MARKET STREET,
MANCHESTER,

OLE AGENTS FOR { "S. B. HÆMATITE," "S. B. YORKSHIRE," "CLAY LANE," 'CLAY CROSS," } PIG IRON

AGENTS FOR JACKSON, GILL, AND CO., IMPERIAL IRONWORKS, NEAR MIDDLESBOROUGH; DARLINGTON WAGON COMPANY, DARLINGTON.

OTCH, HÆMATITE, STAFFORDSHIRE, DERBYSHIRE, FOREST OF N, COLD BLAST AND REFINED PIG IRON, PUDDLED BARS AND IRON, STEEL, SPELTER, TIN, COPPER, LEAD, SHEETS, ORES, TS, NUTS, SPIKES, MANUFACTURED IRON, &c., &c.



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RAILWAY SPRING COMPANY,

MILLSANDS, SHEFFIELD,

ving purchased from the Trustee of the late Firm of W. Charles & Co. the extensive works, with the valuable and improved machinery, are prepared to execute orders for every description of

RAILWAY SPRINGS.

HEPBURN'S
PUMP LEATHER
WATERPROOF

By a special method of preparation, this leather is made solid, perfectly close in texture, and impermeable to water; it has, therefore, all the qualifications essential for pump buckets, and is the most durable material of which they can be made. May be had of all dealers in leather, and of—

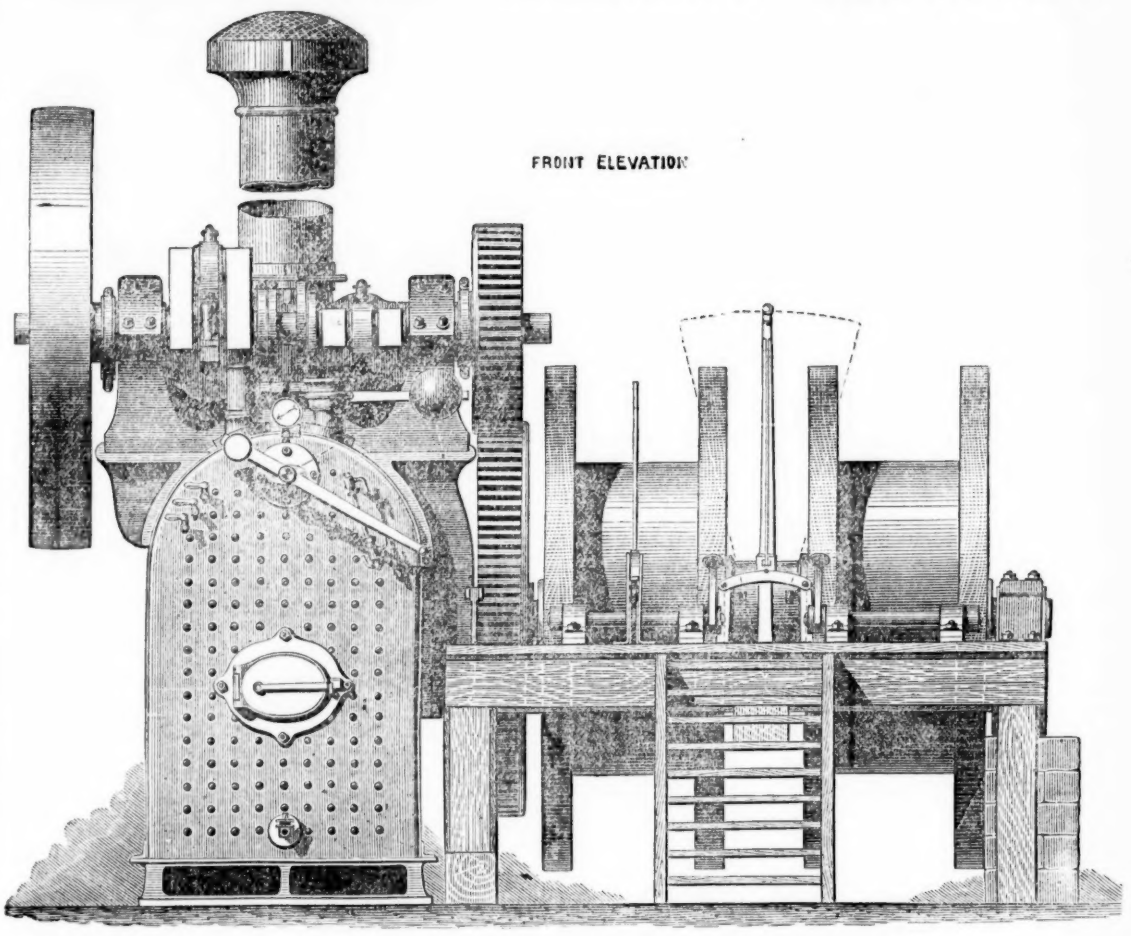
I. AND T. HEPBURN AND SONS,
TANNERS AND CURRIERS, LEATHER MILLBAND AND HOSE PIPE MANUFACTURERS,
LONG LANE, SOUTHWARK, LONDON.
Prize Medals, 1851, 1855, 1862, for
LEATHER BANDS, HOSE, AND LEATHER FOR MACHINERY PURPOSES.

THE GREAT ADVERTISING MEDIUM FOR WALES.
THE SOUTH WALES EVENING TELEGRAM
(DAILY), and
SOUTH WALES GAZETTE
(WEEKLY), established 1857,
The largest and most widely circulated papers in Monmouthshire and South Wales.
CHIEF OFFICES—NEWPORT, MON.; and at CARDIFF.

The "Evening Telegram" is published daily, the first edition at Three P.M., the second edition at Five P.M. On Friday, the "Telegram" is combined with the South Wales Weekly Gazette," and advertisements ordered for not less than six consecutive insertions will be inserted at an uniform charge in both papers.
P.O.O. and cheques payable to Henry Russell Evans, 14, Commercial-street, Newport, Monmouthshire.

THE NEWCASTLE DAILY CHRONICLE,
(ESTABLISHED 1764.)
THE DAILY CHRONICLE AND NORTHERN COUNTIES ADVERTISER
Offices, Westgate-road, Newcastle-upon-Tyne; 50, Howard-street, North Shields; 195, High-street, Sunderland.

THE ROBEY MINING ENGINE.



FROM 20 TO 200 EFFECTIVE HORSE-POWER.

FOR FULL PARTICULARS AND PRICES, APPLY TO—

ROBEY AND COMPANY, LIMITED,

PERSEVERANCE IRONWORKS, LINCOLN.

ALSO OF PATENT PORTABLE

HAULING & WINDING ENGINE

WITH

PATENT DRUM WINDLASSES,

FOR MINING PURPOSES.

This Engine is specially commended to Mining Engineers and others, as by its adoption—
Haulage along inclined drifts is easily and cheaply effected;
The expense of sinking new shafts is greatly reduced, neither foundations nor engine-house being required
It is available not only for winding, but for pumping, sawing, &c.—a great desideratum at a large colliery;
It can be very quickly removed (being self-propelling), and fixed in any desired position.
Prices and full particulars on application as above, and also references to view the engine in successful work near Derby, Carnarvon, Haverfordwest, Darlington, Durham, Penzance, and other places.

THESE ENGINES WORK WITH MARVELLOUS ECONOMY IN FUEL.

CHAS. PRICE AND CO.'S RANGOON ENGINE OIL,

AS SUPPLIED TO H.M. DOCKYARDS AND FLEET.

THIS OIL is suitable to every kind of Machinery. As a lubricant it is equal to the best Sperm or Lard Oil, while it possesses the great advantage of being entirely free from any principle which will corrode the metal bearings.

For particular kinds of Machinery, the Oil may be specially prepared of a consistency and character adapted to the nature of the work to be done.

"Chemical Laboratory, 7, Printing House-square, Blackfriars, April, 1869.

"I herewith certify that the Rangoon Engine Oil, manufactured by Messrs. Chas. Price and Co., is free from any material which can produce corrosion of the metal work of machinery. It is indeed calculated to protect metallic surfaces from oxidation.

"The lubricating power of this oil is equal to Sperm or Lard Oil.

"T. W. KEATES, F.C.S., &c, &c

Every parcel of the Oil sent from the work bears the Trade Mark of the Firm.

LONDON: CASTLE BAYNARD, UPPER THAMES STREET.
WORKS: MILLWALL, POPLAR; and ERITH, KENT

VIENNA EXHIBITION, GROUP XIII, STAND No. 457. INTERNATIONAL EXHIBITION, LONDON, No. 2 ENGINE SHED, WEST SIDE.

TANGYE BROTHERS AND HOLMAN,

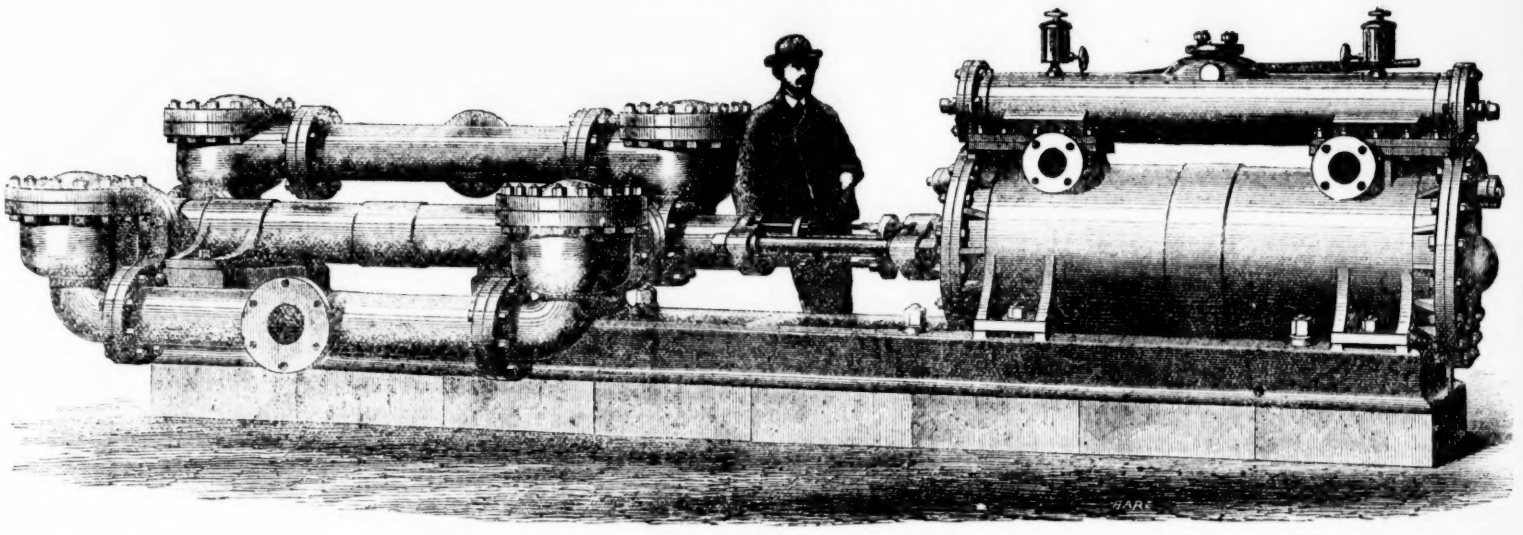
10, LAURENCE POUNTNEY LANE, LONDON,

CORNWALL WORKS (TANGYE BROTHERS), BIRMINGHAM,
NEWCASTLE-ON-TYYE (TANGYE BROTHERS AND RAKE), OFFICES AND WAREHOUSE, ST. NICHOLAS' BUILDINGS.
SOLE MAKERS OF

THE "SPECIAL" DIRECT-ACTING STEAM PUMPING ENGINES

FOR FORCING WATER FROM MINES.

Nearly 3000 in Use.



The "SPECIAL" Direct-acting Steam Pumping Engines require no costly Engine Houses or massive foundations, no repetition of Plunger Lifts, ponderous Connecting-rods, or complication of Pitwork, and allow a clear shaft for hauling purposes.

Extract from "ENGINEERING," September 6th, 1872:—

"The accompanying engraving illustrates a large specimen of the 'Special' Steam Pump, which was brought before the public about four years since by Messrs. Tangye Brothers and Holman. The Pump is the invention of Mr. S. Cameron, of New York, and since its introduction Messrs. Tangye have turned out nearly 3000 from their works.

"These pumps are of various sizes, and at first only small ones were made, but as their usefulness became developed the manufacturers designed pumping engines on the same principle for use in collieries. They were first applied to this purpose in the Newcastle collieries about three years since, and through the efforts of the late Mr. A. Stansfield Rake, under the direction of Messrs. Tangye, about 130 of these pumps had been introduced—principally in the collieries of the Durham and Newcastle districts, up to the end of 1870. They were adapted to perform the required duty—varying in almost every case—of forcing from 1000 to 10,000 gallons per hour from depths ranging from 100 to 500 ft. The succes of this system of pumps led Mr. J. Bigland, the manager of Messrs. Pease's Bishop Auckland Collieries, to conclude that it was adapted for yet heavier work. The result of his investigations into its working led to the manufacture of the engine we have illustrated, for the Adelaide Collieries, belonging to Messrs. Pease, at Bishop Auckland.

"The construction of the Special Steam Pump is so well known that we need now do no more than refer to the dimensions of the various parts. The steam cylinder is 26 in. diameter, and the pump—which is double acting—is 6½ in. diameter, with a 6-ft. stroke. The slide valve is steam-moved, and its alternate action is effected by means of two steel reversing valves, operated by the piston in the interior of the cylinder at either end. Hence there is no external mechanism except the piston rod, a few inches only of which is seen reciprocating between the stuffing boxes of the steam and pump cylinders. In the contract it was stipulated that the engine should raise 120 gallons per minute 1040 ft. high in a single lift, and this is more than accomplished, with apparently as much ease as if its load was delivered at only 100 ft. high.

"The engine-room at the Adelaide Collieries is situated at a depth of 1040 ft. below the surface, and is an arched chamber, about 100 ft. long by 20 ft. wide, and 10 ft. high at centre. At the far end of this chamber is a double-flued boiler, 27 ft. long and 7 ft. in diameter. Placed between the boiler and the shaft is the pumping engine we have been describing. It was started on June 6, 1871, and Mr Bigland reported that, having measured its duty, he found the average of seven trials to be 137 gallons per minute, thus giving a higher duty than was stipulated for in the contract.

"A still larger Special Steam Pump than the one already described has since been made by Messrs. Tangye for Messrs. Stannier's [illegible] lieries, Silverdale, Staffordshire. The steam cylinder of this engi[illegible] is 32 in. in diameter, and the water cylinder 10¼ in.; the stroke [illegible] 6 ft., and the engine has to raise 22,500 gallons per hour 540 ft. high. Two out of eight engines for some extensive coal mines in Germany are also in a forward state; each of these engines is to be capable of raising 150 gallons per minute, or 9000 gallons per hour, 720 ft. high. This system of underground pumping engine undoubtedly carries with it the recommendations of simplicity and great power with a small number of mechanical parts. Its first cost is also very moderate, as compared with the method of raising water from great depths by a series of 40 or 50 fm. lifts. Its practical value was [illegible] tested in 1867 by the award of a silver medal by the Royal Cornwall Polytechnic Society, which is composed chiefly of mining engineers. In fact, these engines appear to solve a very important commercial question in mining operations—viz., the most economical and effective means of deep mine drainage. Their success has been established in the coal mines of Durham and Newcastle, and there is no reason why their adoption should not follow, as occasion requires, in the copper and tin mines of Cornwall, some of which are of great depth; and especially for foreign mines, where transpopt convenience and economy are of paramount consideration."

The "Special" Steam Pumping Engines are in use at the following among many other Collieries:—

Adelaide Colliery, Bishop Auckland	3	Pumps.	North Bitchburn Colliery, Darlington	2	Pumps.	Stott, James and Company, Burslem	1	Pump
Acomb Colliery, Hexham	1	„	Newton Cap Colliery, Darlington	1	„	Straker and Love, Brancepeth Colliery	1	„
Blackfell Colliery, Gateshead	1	„	Normanby Mines	1	„	Seaton Delaval Coal Colliery, near Newcastle	1	„
Black Boy Colliery, Gateshead	1	„	Oakenshaw Colliery	1	„	Thornley Colliery, Ferryhill	2	„
Castle Eden Colliery	2	„	Pease's West Colliery	2	„	Thompson, John, Gateshead	2	„
Carr, W. C., Newcastle	4	„	Pease, J. and J. W., near Crook	5	„	Trimdon Grange Colliery	1	„
Etherley Colliery	1	„	Pease, J. and J., Brandon Colliery	1	„	Tudhoe Colliery	4	„
Gidlow, T., Wigan	3	„	Pegswood Colliery, near Morpeth	2	„	Vobster and Mells Colliery	2	„
Haswell, Shotton and Easington Coal Company	3	„	Pelton Fell Colliery	1	„	Widdrington Colliery, Morpeth	5	„
Lochgelly Iron and Coal Company	2	„	Railey Fell Colliery, Darlington	1	„	Whitworth and Spennymoor Colliery	5	„
Lochore and Capeldrae Cannel Coal Company	6	„	Right Hon. Earl Durham, Fence Houses	1	„	Westerton Colliery, Bishop Auckland	1	„
Leather, J. T., near Leeds	2	„	Skelton Mines	1	„	Wardley Colliery, Gateshead	1	„
Lumley Colliery, Fence Houses	1	„	South Benwell Colliery	5	„	Westminster Brymbo Coal Company	2	„
Monkwearmouth Colliery, Sunderland	1	„	St. Helens (Tindale) Colliery	1	„	Weardale Coal and Iron Company	5	„

PARTICULARS OF THE "SPECIAL" STEAM PUMPING ENGINES SUITABLE FOR HIGH LIFTS IN MINES.

Diameter of Steam Cylinder ....Inches	6	8	10	8	12	16	10	14	18	21	14	18	21	26	16	21	26
Diameter of Water Cylinder ....Inches	3	3	3	4	4	4	5	5	5	5	6	6	6	6	7	7	7
Length of Stroke ....Inches	24	24	36	24	36	48	24	36	36	48	36	36	48	72	36	48	48
Strokes per minute	30	30	20	30	20	15	30	20	20	15	20	20	15	10	20	15	15
Gallons per hour	2,200	2,200	2,200	3,000	3,900	3,900	6,100	6,100	6,100	6,100	8,800	8,800	8,800	8,800	11,900	11,900	11,900
Height in feet to which water can be raised with 40 lbs. pressure per square inch of steam at pump	240	425	665	240	540	960	240	470	775	1,058	320	540	740	1,140	312	540	700
Diameter of Suction and Delivery ...Inches	2	2	2	3	3	3	3½	3½	3½	3½	4	4	4	4	5	5	5
Diameter of Steam Inlet ....Inches	¾	1	1¼	1¼	2½	2½	1¾	2½	3	3½	2½	3	3½	4	2½	3½	4
Diameter of Exhaust ....Inches	1	1½	1½	1½	2½	3	1¾	2½	3½	4	2½	3½	4	5	3	4	5

PARTICULARS, &c.—*Continued.*

Diameter of Steam Cylinder ....Inches	30	18	24	30	32	18	24	30	36	21	30	36	42	26	36	44	50
Diameter of Water Cylinder ....Inches	7	8	8	8	8	9	9	9	9	10	10	10	10	12	12	12	12
Diameter of Stroke ....Inches	72	36	48	72	72	36	48	48	72	48	72	72	72	48	72	72	96
Strokes per minute	10	20	15	10	10	20	15	15	10	15	10	10	10	15	10	10	10
Gallons per hour	11,000	15,660	15,660	15,660	15,660	19,800	19,800	19,800	19,800	24,400	24,400	24,400	24,400	35,240	35,240	35,240	35,240
Height in feet to which water can be raised with 40 lbs. pressure per square inch of steam at pump	1,100	300	540	840	960	240	427	665	960	264	540	780	1,062	282	540	800	1,040
Diameter of Suction and Delivery ...Inches	5	6	6	6	6	7	7	7	7	8	8	8	8	10	10	10	10
Diameter of Steam Inlet ....Inches	5	3	4	5	5½	3	4	5	6	3½	5	6	7	4	6	8	8
Diameter of Exhaust.... Inches	6	3½	5	6	6½	3½	5	6	7	4	6	7	8	5	7	9	10

PRICES OF THE ABOVE ON APPLICATION.

Any combination can be made between the Steam and Water Cylinders, to suit Height of Lift and Pressure of Steam.

TANGYE BROTHERS & HOLMAN, 10, Laurence Pountney Lane, London, E.C.

Printed by RICHARD MIDDLETON, and published by HENRY BAGSHAW (the proprietors), at their office, 26, FLEET STREET, E.C., where all communications are requested to be addressed.—August 2, 1873.